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USSR REPORT  
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BIOMEDICAL AND BEHAVIORAL SCIENCES

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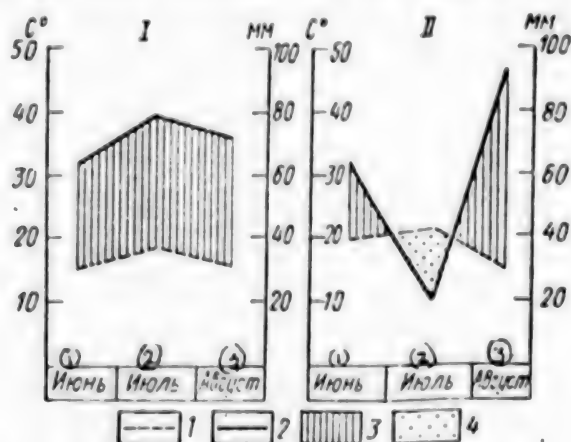
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## EFFECT OF WEATHER CONDITIONS OF SUMMER OF 1981 ON DEVELOPMENT OF DIFFERENT TYPES OF FUNGI IN MOSCOW AREA

Moscow BYULLETEN MOSKOVSKOGO OBSHCHESTVA ISPYTATELEY PRIRODY: OTDEL BIOLOGICHESKIY in Russian Vol 90 No 1 1985 (manuscript received 10 Dec 82) Pp 85-92

[Article by L. M. Levkina and I. I. Sidorova]

[Text] The summer of 1981 in the Moscow Oblast was unusually hot and dry. This is indicated by a comparison of meteorological data for the summer months of 1981 to the corresponding average perennial temperature and humidity data for the Moscow area. In order to visualize this better the data have been presented in the form of climatograms (Valter, 1975) from which one can see that the weather factors in 1981 sharply deviated from the norm and were extreme for the Moscow Oblast (diagram).



1. Air Temperature and Rainfall in the Odintsovskiy Rayon of the Moscow Oblast During the Summer Months (Climogram):

I - Average perennial data; II - Average monthly temperature and rainfall in 1981; 1 -- temperature curve; 2 -- rainfall curve; 3 -- humidity zone; 4 -- arid zone

Key:

1. June
2. July
3. August

The observations were recorded at the Zvenigorod Biological Station of Moscow University (ZBS) in the Odintsovskiy Rayon of Moscow Oblast. Beginning in 1952, instructors in the Department of Lower Plants and students of the Biology Faculty at Moscow University have been observing the development of macro- and micromycetes at this observation station.

In 1981 the general picture of dynamics in the development of various groups of fungi was disrupted, changes in species composition took place, and massive disease epidemics were observed in certain plants that do not usually become infected or that suffer only mild infections.

There are about 30 species of Peronosporales fungi in the ZBS area. Some of them are widely distributed and almost annually cause epidemic plant diseases in the Moscow Oblast. These include *Plasmopora nivea* Schrot. on goutweed (*Aegopodium podagraria* L.), *Peronospora effusa* de By on white goosefoot (*Chenopodium album* L.), *Peronospora alta* Fuck. on greater plantain (*Plantago major* L.), *Peronospora parasitica* Fr. and *Albugo candida* (Pers.) Gray on shepherd's purse (*Capsella bursa-pastoris* (L.) Med. In 1981 these species were noted in the ZBS area only at the end of May and beginning of June. By the end of June only *P. nivea* was noticed on some goutweed in heavily shaded and low level wooded areas. One more Peronosporales fungus, *Phytophthora infestans* de Bary, appeared at the end of August on potato plants, although the disease was not widespread in spite of the fact that the weather conditions in September were close to normal. Thus, for the first time in 30 years not a single case of Peronosporales epidemic plant disease was observed.

The second characteristic of this vegetative season is the unusually luxuriant development of Erysiphales representatives. Large groups of plants profusely covered by a grey floury deposit caught our attention in the woods, meadow, and field. The heavy infestation by this downy mildew resulted in the death of some plants or entire beds of lungwort (*Pulmonaria obscura* Dumort.), nettle (*Urtica dioica* L.), touch-me-not (*Impatiens nolitangere* L.), cow parsnip (*Heracleum sibiricum* L.), and creeping buttercup (*Ranunculus repens* L.). The general plant infestation picture was reminiscent of the downy mildew epidemic of 1972 when there was a drought in the Moscow Oblast.

Less than a dozen species of *Peronospora* fungi cause epidemic diseases in the ZBS area every year. In 1981 the number of epiphytotic-inducing species more than doubled (Table 1).

Some of the *Peronospora* fungi species indicated in Table 1 have been found in the Moscow Oblast every year and frequently cause epidemic diseases. These include downy mildew of archangel, lungwort, grasses, lady's mantle, plantain, and bindweed. The remaining species are encountered frequently, but do not cause epidemic diseases. One such example is *E. urtica*. According to the data of M. V. Gorlenko (1983), this fungus caused an epidemic disease in the year 1972 only.

Table 1. Epiphytotic-Inducing Peronospora Fungi in 1981

① Гриб-паразит	② Растение-хозяин	③ Частота встреч в Московской обл.*	④ Время появления (мес)
<i>Erysiphe artemisia</i> (Wallr.) Grev.	виды рода <i>Artemisia</i> ⑤	ежегодно ⑧	VI
<i>E. asperifoliorum</i> Grev.	<i>Pulmonaria obscura</i> Dumort.	•	VI
<i>E. balsaminae</i> (Wallr.) Kari.	<i>Impatiens nolitangere</i> L.	часто ⑨	VI
<i>E. cichoracearum</i> (DC) Merat.	<i>Lactuca muralis</i> (L.) Fresen.	•	VI
<i>E. convolvuli</i> (DC) St. Am.	<i>Convolvulus arvensis</i> L.	ежегодно ⑧	VI
<i>E. depressa</i> (Wallr.) Schlecht.	<i>Arctium tomentosum</i> L.	часто ⑧	VI
<i>E. galeopsidis</i> (DC) Merat.	<i>Galeobdolon luteum</i> Huds.	ежегодно ⑧	VI
<i>E. graminis</i> (DC) Merat.	<i>Stachys silvatica</i> L.	часто ⑨	VI
<i>E. heraclei</i> (DC) St. Am.	виды родов ⑥ <i>Poa</i> , <i>Triticum</i> , <i>Agropyron</i> , <i>Dactylis</i> , <i>Calamagrostis</i> и др.	•	V, VI
<i>E. hyperici</i> (Wallr.) Blum.	<i>Heracleum sibiricum</i> L.	редко ⑩	VII
<i>E. knauti</i> Daly	<i>Chaerophyllum aromaticum</i> L.	•	
<i>E. polygoni</i> (DC) St. Am.	<i>Hypericum maculatum</i> Crantz.	ежегодно ⑧	VII
<i>E. ranunculi</i> Grev.	<i>Succisa pratensis</i> Moench.	часто ⑨	VII
<i>E. sordida</i> (L.) Junell.	<i>Polygonum aviculare</i> L.	ежегодно ⑧	VI
<i>E. trifolii</i> Grev.	<i>Ranunculus repens</i> L.	•	VI
<i>E. urtica</i> (Wallr.) Blum.	<i>Plantago major</i> L.	часто ⑨	VI
<i>Sphaerotheca alchemilla</i> (Grev.) Junell.	виды <i>Trifolium</i> L. ⑦	ежегодно ⑧	VI
<i>S. erigerontis-canadiensis</i> Junell.	<i>Urtica dioica</i> L.	часто ⑧	VI
<i>Microsphaera palczewskii</i> Jacz.	<i>Alchemilla vulgaris</i> L.	ежегодно ⑧	VI
<i>M. van-bruntiana</i> Gerard.	<i>Geum urbanum</i> L.	часто ⑧	VI
	<i>Taraxacum officinale</i> Web.	ежегодно ⑧	VI
	<i>Caragana arborescens</i> Lam.	редко ⑩	VI
	<i>Sambucus racemosa</i> L.	—	—

Key:

- ① \* Здесь и в табл. 2 и 3 по данным М. В. Горленко (1983).
1. Parasitic fungus
  2. Plant host
  3. Frequency observed in the Moscow Oblast\*
  4. Time of appearance (month)
  5. Species of the *Artemisia* family
  6. Species of the families *Poa*, *Triticum*, *Agropyron*, *Dactylis*, *Calamagrostis* and others.
  7. Species *Trifolium* L.
  8. Annually
  9. Frequently
  10. Rarely
  11. \* Here and in Tables 2 and 3, according to the data of M. V. Gorlenko (1983).

An epiphytotic downy mildew infection of elder is noted in Table 1. The etiological agent, first discovered in the ZBS area in 1979, caused an epidemic disease in 1980 (Gelyuka, Gorlenko, 1981). In 1981 *Microsphaera van-bruntiana* appeared on elder as early as May, although the epidemic disease began in June.

In 1981 there was an increase of the *Peronospora* fungi which caused severe or moderate plant infections (Table 2). *E. heraclei* which attack Umbelliferae, caused a moderate infestation on parsley and Angelica (Table 2) and brought about an epidemic disease on cow parsnip and chervil (Table 1) whereas wild parsley and Angelica are more severely infested in normal years.

Table 2. *Peronospora* Fungi Inducing Severe or Moderate Plant Infection

(1) Гриб-паразит	(2) Растение-хозяин	(3) Частота встреч в Моск.-ской обл.	(4) Время появления (мес)
<i>Erysiphe biocellata</i> Endern.	<i>Ajuga reptans</i> L.	ежегодно	VI
<i>E. cichoracearum</i> (DC) Meral.	<i>Cirsium arvense</i> (L.) Scop. <i>Cirsium oleraceum</i> (L.) Scop. <i>Centaurea jacea</i> L. <i>Solidago canadensis</i> L. <i>Sonchus arvensis</i> L.	часто	начало VII
<i>E. galiopsidis</i> DC.	<i>Lamium album</i> L.	"	VII
<i>E. heraclei</i> (DC) St. Am.	<i>Anthriscus silvestris</i> (L.) Hoffm. <i>Angelica silvestris</i> L.	"	VII
<i>E. knautii</i> Daly	<i>Knautia arvensis</i> (L.) Coult.	"	VII
<i>E. trifolii</i> Grev.	<i>Lupinus polyphyllus</i> Lindl.	"	VII
<i>Sphaerotheca alchemilla</i> (Grev.) Jubell.	<i>Filipendula ulmaria</i> (L.) Maxim.	ежегодно	начало VI
<i>Podosphaera myrtillina</i> Kunze	<i>Vaccinium myrtillus</i> L.	часто	VII

Key:

1. Parasitic fungus
2. Plant host
3. Frequency observed in Moscow Oblast
4. Time of appearance (month)
5. Annually
6. Frequently
7. Beginning

It is interesting to note that *Microsphaera alphitoides* Grett. et Maubl. which almost every year caused an epidemic disease on oak, attacked oak to a very slight degree in 1981 (Table 3).

According to the data of M. V. Gorlenko, *E. Galeopsidis* at first appears on archangel, and later spreads to hemp-nettle and hedge woundwort. In 1981 archangel and woundwort were heavily infested (Table 1), but hemp-nettle was hardly affected (Table 3).

By comparing the appearance times of individual *Peronospora* fungi species (Tables 1, 2, and 3) to the corresponding perennial data (Gorlenko, 1983), one can see the dates at which the downy mildew appeared are 15 to 20 days earlier. The peak of the greatest *Peronospora* fungi development did not occur in the second half of the summer, as has been the usual case, but began as early as June and continued throughout the entire summer.

One should note one more change in the development of *Peronospora* fungi in during this season, and that is the earlier appearance of cleistothecia.

In addition to representatives of Erysiphales, epidemic diseases were also caused by two pathogens of the sac fungi class: *Protomyces macrosporus* Unger. on goutweed and *Epichloe typhina* (Pers.) Winter on wild grasses. *Protomyces macrosporus* has been observed on goutweed every year in the ZBS area, and the weather conditions of 1981 had little effect on this parasite with an endophyte mycelium.

Table 3. *Peronospora* Fungi Causing Slight Plant Infection

(1) Гриб-патоген	(2) Растение-хозяин	(3) Частота встреч в Московской обл.	(4) Время появления (мес)
<i>Erysiphe biocellata</i> Enbern.	<i>Prunella vulgaris</i> L.	редко (5)	VI
<i>E. cichoracearum</i> (DC.) Merat.	<i>Cucumis sativus</i> L.	часто (6)	VII
	<i>Tanacetum vulgare</i> L.		
<i>E. cruciferarum</i> Opiz. ex Junell.	<i>Hesperis matronalis</i> L.	,	VII
<i>E. galeopsidis</i> DC.	<i>Galeopsis tetrahita</i> L.	,	VII
<i>E. graminis</i> (DC.) Merat.	<i>Festuca gigantea</i> L.	редко (5)	VII
<i>Microsphaera alpitoides</i> Grett.	<i>Quercus robur</i> L.	ежегодно (7)	VIII
<i>M. boemleri</i> Magn.	<i>Vicia silvatica</i> L.	часто (6)	VIII
<i>M. divaricata</i> Lev.	<i>Rhamnus cathartica</i> L.	,	VIII
<i>Sphaerotheca erigerontis-canadiensis</i> (Lev.) Junell.	<i>Lapsana communis</i> L.	,	VI
<i>Sphaerotheca fuliginea</i> Poll.	<i>Veronica chamaedris</i> L.	,	VI
<i>S. melampyri</i> (L.) Junell.	<i>Melampyrum pratense</i> L.	редко (5)	VIII
	<i>Melampyrum nemorosum</i> L.		
<i>Podosphaera tridactyla</i> (Wallr.) de Bary	<i>Pudus racemosa</i> (Lam.) Gilib.	,	VIII
<i>Uncinula adunca</i> Lev.	на видах <i>Salix</i> L.	часто (6)	VIII

Key:

1. Fungal pathogen
2. Plant host
3. Frequency encountered in Moscow Oblast
4. Time of appearance (month)
5. Rarely
6. Frequently
7. Annually

Table 4. Rust Fungi Causing Plant Epidemic Disease in 1981

(1) Ржавчинный гриб	(2) Растение-хозяин	(3) Кол-во встреч на террито- рии ЗБС	(4) Год появления заболевания		(5) Время появ- ления телий	(6) Стадия, на которой инфито- тико
			1952—1980	1981		
<i>Coleosporium senecionis</i> (Shum.) Fr.	<i>Senecio fluviatilis</i> Wallr.	(rarely) редко	—	VII	VII	II, III
<i>C. tussilaginis</i> (Fuck.) Died.	<i>Tussilago farfara</i> L.	•	VII	VI	VII	II, III
<i>Puccinia arenariae</i> (Shum.) Wint.	<i>Stellaria nemorum</i> L.	(frequently) часто	VI, VII	VI	VI	III
<i>P. leontodontis</i> Jacky	<i>Leontodon hispidus</i> L.	(rarely)	—	VII	VIII	II, III
<i>P. menthae</i> Pers.	<i>Mentha arvensis</i> L.	редко	VII	VI	VII	II, III
<i>P. triticina</i> Eriks.	<i>Triticum aestivum</i> L.	часто (frequently)	VI	VI	—	II

Key:

1. Rust fungus
2. Plant host
3. Number of times observed in ZBS area
4. Year of disease's appearance
5. Appearance of teliospores
6. Stage at which epidemic disease is initiated

Grass cattail disease appeared early in 1981, at the beginning of June, as a severe outbreak in cocksfoot (*Dactylis glomerata* L.) and meadow fescue (*Festuca pratensis* Huds.) Epidemics of this disease are sometimes observed in the Moscow Oblast during normal weather years.

An entire series of characteristics was observed in the development of another group of pathogens -- the rust fungi. During this season, the Uredinales were represented to a lesser degree than in the conventional years. Significant changes did occur in the species composition of the rust fungi, particularly among the forms that caused epidemics (Table 4).

Along with the annually encountered and broadly distributed *Puccinia arenariae* Wint. and *P. triticina* Eriks., Table 4 indicates four other species of rust fungi which were rarely observed in the ZBS area and which never caused epidemics.

Coltsfoot has been severely infested by *Puccinia poarum* Nielsen every year in the ZBS area. It is interesting to note that in 1981 *P. poarum* was supplanted by *Coleosporium tussilaginis* Died. The intermediate host of *C. tussilaginis* is pine on whose needles the fungus forms sporocarps, and the coltsfoot is infected by the aeciospores. We did not observe pine infestation, so it must be presumed that the very top layers of the trees were infected.

The early appearance of teliospores was observed in all species of rust fungi. Therefore, the uredinium and telio stages were observed almost simultaneously in many rust fungi in July.

In some Uredinales the aecium stage was shorter than usual and the infestation of the plant host was mild. Thus, *Puccinia coronata* Cda., which usually yields aecia on *Rhamnus frangula* at the end of May or beginning of June up to the end of July, was observed on buckthorn leaves only during the first weeks of June this year, and there were few fungal pustules. Uredinales *P. coronata* appeared on wild grasses one month earlier than usual. The same picture was observed in the case of aecium and uredinium *P. caricina* DC. and *Uromyces geranii* Lev.' Plant infestation during the aecium stage was mild.

However, an unusually late appearance of the aecium stage on *Sorbus aucuparia* L. was noted in the case of *Gymnosporangium juniperi* Link, i.e., during the first week of August, whereas aecium of this fungus annually appears on mountain ash as early as June.

Rust fungi which cause perennial infections of plant hosts such as *Puccinia obscura* Schrot., *Puccinia suaveolens* (Pers.) Rostr., *Chrysomyxa pirola* Wint. and the microforms *P. asarina* Kuntze., *Puccinia aegopodii* Rbh., and *R. arenaria* Wint., turned out to be more stable, but nevertheless reacted to unfavorable weather conditions by a certain acceleration of their developmental cycle.

Representatives of the order Ustilaginales were least of all affected by extreme weather conditions. A small number of Ustilaginaceae fungi is found on wild-growing plants of the ZBS area. The most prevalent species include *Schizonella melanogramma* (DC) Schröt., *Ustilago stellariae* Liro and *Cintractia caricis* (Pers) Magn. As was the case in previous years, *Schizonella melanogramma* caused an epidemic disease on *Carex digitata* L. and *Carex acuta* L. in spruce-(zelenomoshnik). A few outbreaks of *Ustilago stellariae* in pollen grains of *Stellaria hostea* L. were observed at the beginning of June in the birch-spruce woods, but the *Ustilago* disappeared earlier than usual, i.e., by June 15. At the end of June *C. caricis* appeared on *C. digitata* in the forest and on *Carex nigra* (L.) Reichard. in the upper marshland. Sedge smut remained in the upper marshland throughout the entire season.

These pathogens' considerable independence of environmental factors is doubtless associated with the diffuse infection of the plant hosts brought about by them. Consequently, the pathogens are better protected against unfavorable environmental impacts.

One should note two epiphytotic episodes caused by the incomplete fungi: *Septoria aegopodii* Sacc. on goutweed and *Ovularia schraeter* (Kuhn.) Sacc. on lady's mantle (*Alchemilla vulgaris* L.). *Septoria* has been observed on goutweed every year, but not a single epidemic episode has been observed in the last 30 years. The pathogen sporophores almost completely covered both sides of the goutweed leaves. The plants were severely infested to the same degree in all areas of their habitat.

It is possible that the moisture deficiency contributed to the plants' deterioration and apparently enhanced the dissemination of pathogen spores. In addition, the downy mildew *Plasmopara nivea* which has been causing epiphytotic episodes every year, was absent on the goutweed.

The water balance during the summer months of 1981 which was uncharacteristic of the Moscow area also affected the fruit bodies of macromycetes.

One should first of all note the almost complete absence of fruit bearing among the representatives of the Boletaceae family that is common to the ZBS area. These include *Boletus edulis* Fr., *Leccinum scabrum* (Fr.) S. F. Gray, *Leccinum testaceoscabrum* (Sacc.) Sing., *Leccinum aurantiacum* (St. Am.) S. F. Gray, *Suillus luteus* (Fr.) S. F. Gray, and *Suillus granulatus* (Fr.) Kuntze. Single fruit bodies of these representatives evolved only in September and their total biomass (by species) came to 0.5 -- 3.2 percent of the average of fruit body dry weight over a five-year period (Table 5). An exception to this situation was *Xerocomus subtomentosus* (Fr.) Quel. which was found to be in a rather abundant quantity in the second half of August and in September (biomass up to 30 percent of the average over a five-year period), and *Leccinum holopus* (Rostk.) Wahl., which inhabits the transitional type Sphagnum marshes of the ZBS area in which the substrate retained a rather high level of humidity throughout the summer (18 percent of the average over a five-year period in two sectors, 200 square meters and 400 square meters in area).

Table 5. Biomass (in grams) of Dry Fruit Bodies of Certain Macromycetes in the 1981 Season and the Average Biomass from 1976 to 1980 (Average for 26 Sectors, 400 sq. meters)

(1) Вид	(2) Средняя за 1976-1980 гг.	1981 г.	% от (2) средняя
<i>Boletus edulis</i> . . . . .	62,0	0,3	0,5
<i>Leccinum scabrum</i> . . . . .	47,3	1,32	2,8
<i>Leccinum testaceosabrum</i> . . . . .	18,2	0,2	1,1
<i>Suillus luteus</i> . . . . .	52,0	1,6	3,2
<i>Suillus granulatus</i> . . . . .	24,4	0,51	2,1
<i>Leccinum aurantiacum</i> . . . . .	38,1	0,3	0,8
<i>Xerocomus subtomentosus</i> . . . . .	112,4	33,1	29,5

Key:

1. Species
2. Average for 1976-1980
3. Percent of the average

The level of fruit bearing was significantly suppressed in representatives of the family Corinariaceae (particularly in the genus *Cortinarius*, individual fruit bodies of whose representatives were found only at the end of August), most of the usual species of Russulaceae as well as bedding saprotrophs of the genus *Mycena*, and others. The formation of individual fruit bodies was observed in the latter only after rainfall in the first and second ten-day periods of August whereas the large-scale development of fruit bodies during this year had shifted to the end of August and September.

Certain species of xylotrophic agars bore fruit more abundantly. These included *Kuehoeromyces mutabilis* (Fr.) Sing. et Smith, the species *Hypholoma* (*H. sublateritium* (Fr.) Quel., *H. fasciculare* (Fr.) Kummer), and *Pleurotus*. Fruit bearing of *Armillariella mellea* began in the third ten-day period of August and continued to the end of September (the last samples were found September 24).

Along with the suppressed development of fruit bodies in some species of macromycetes, massive fruit bearing that is unusual for the ZBS area was noticed in a number of species that are rarely encountered or that are found in few numbers. These include, for example, *Paxillus atromentosus* (Batsch.) Fr. and *Hygrophoropsis aurantiaca* (Fr.) R. Mre.

Unusually abundant fruit bearing was noted in the *Russula delica* Fr. in September 1981. The number of fruit bodies in numerous colonies of this species (67) that were mapped out in the ZBS zone that form an average of 3.4 fruit bodies over the fruit-bearing period (average data are for six years) fluctuated from 14 to 66 (an average of 24.7 fruit bodies).

It is interesting to note that during this period all of the colonies of this species known to us in the ZBS zone bore fruit, although their fruit-bearing periods are usually observed once every two or three years.

The formation of fruit bodies in this species was shortened to the end of September and was completed in October. The microparasite *Cladobotryum apiculatum* Gams which attacked up to 85 percent of the fruit bodies in some colonies was continuously observed on the fruit bodies (in 18 colonies) throughout the entire period of mass fruit bearing in the *Russula delica*. This phenomenon was noted for the first time during the entire observation period (beginning in 1967). *C. apiculatum* usually developed on *Russula* species from the Compactae section during the period of July through the first ten-day period of August at high average daily air and soil temperatures..

The *Paxillus involutus* (Batsch.) Fr., one of the most prevalent conventionally edible mushrooms in the ZBS area, bore abundant fruit in the 1981 season, beginning in the middle of August. One should note that this species underwent a massive infection by the microparasite *Apiocrea chrysosperma* Fr. Whereas this species infested an average of about 3 percent of the mushroom fruit bodies from 1969 to 1980, 26.1 percent were infected in 1981. Practically all of the rather old fruit bodies were either partially or completely coated by the parasite mycelium.

The unusual weather conditions enabled us to track the effect that the most important meteorological factors, temperature and humidity, had on fungal growth.

Humidity plays the primary role here, since temperature had more of an indirect influence by contributing to soil and air dryness. Radical deviations from the optimal daytime temperature (up to 32°) that were observed in this season could only temporarily retard development because the growth of most mushrooms proceeds normally within a broad temperature range.

The disappearance of psychrophilic groups of fungi is primarily explained by insufficient humidity. Moisture affects spore formation, the release and scattering of spores, and is essential to the processes of plant infection in these fungi.

Insufficient humidity contributed to the prevalence of xerophilic and xero-tolerant species. Dry air favored the scattering and germination of their spores, and, by reducing the tissue turgor of higher plants, facilitated the penetration of certain pathogens (*Erysiphales*) into the tissue of growth tubules.

Our observations also confirmed that closely related species do not always react in the same way to environmental factors. i.e., they react individually.

The data we have obtained make it possible to understand better the interrelationships between individual fungal species and the environment.

A thorough study of such interrelationships will make it possible to predict with accuracy the appearance of various groups of macro- and micromycetes as affected by weather conditions.

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BACTERIOLOGIC STABILITY OF COMPRESSED AND LOOSE MIXED FEED ON STORAGE

Krasnodar IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: PISHCHEVAYA TEKHNOLOGIYA  
in Russian No 5, Sep-Oct 85 (manuscript received 28 Apr 84) pp 28-31

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[Abstract] Studies were conducted on the bacteriologic stability of loose and compressed mixed feed PK-4 in the course of storage in the fall-winter season in an open and closed facility. In the closed facility, the air temperature ranged from 18 to 22°C with a relative humidity of 40-45%, and in the open storage area the respective figures were -10 to +8°C and 76-98%. The moisture content of the loose and compressed feed increased to 13.0 and 12.7%, respectively, from 11.1% after 90 days in the open facility. In the closed facility it decreased to 9.8% for the loose feed and to 8.8% for the compressed feed. During the 90 day storage period, the acid number of compressed and loose feed increased to 49 and 56 g KOH, respectively, from 40 g KOH in the closed facility, and to 44 and 45 g KOH, respectively, in the open facility. Over the 90 day storage period, the bacterial counts increased several-fold for both feed forms, but the increase was most pronounced for the loose form in the open facility. A similar increase was seen in the counts of various molds (*Aspergillus*, *Penicillium*, *Alternaria*, *Mucor*, *Fusarium*, etc.). Figures 3; references 3 (Russian).

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PHOTOCHEMICAL ACTIVITY OF CHLOROPLASTS AND WATER-EXCHANGE OF FINE-FIBER COTTON UNDER EFFECT OF PHYSIOLOGICALLY ACTIVE SUBSTANCES

Dushanbe IZVESTIYA AKADEMII NAUK TADZHIKSKOY SSR: OTDELENIYE BIOLOGICHESKIKH NAUK No 3, Jul-Sep 85 (manuscript received 31 Oct 84) pp 66-68

[Article by P.D. Kolesnikova, I.Sh. Muratova and Sh. Makhmadiyev, Dushanbe Order of Friendship of Peoples State Pedagogical Institute imeni T.G. Shevchenko]

[Abstract] The effect of indolyl-acetic acid (IUK) and of chlorocholine chloride (TUR) on transpiration intensity and photochemical activity of chloroplasts and photosynthesis intensity was studied in the 5595-V variety of fine-fiber cotton leaves, at the beginning of the vegetation period. After soaking in water, cotton seeds were placed for 1 day in IUK and TUR solutions of various concentrations. Shoots grown in distilled water served as control plants. Photochemical activity of the chloroplasts, photosynthesis intensity and transpiration intensity were determined in 30-day old plants. The growth regulators had various effects on the cotton plant photosynthesis apparatus. Soaking the seeds in an IUK solution (0.001 percent) increased photochemical activity of the chloroplasts. TUR ( $10^{-3}$  percent concentration) greatly increased transpiration intensity in the cotton leaves, probably due to redistribution of water in the plant cells with an increase of firmly bound water and an increase of water-retention capacity of plants under the effect of TUR. Combined use of TUR and auxin did not reduce transpiration intensity. A slight increase of transpiration under the effect of IUK ( $10^{-4}$  percent concentration) was attributed to the effect of auxin on the state of water in the plant cells. This marked inhibiting effect of TUR on photochemical activity, photosynthesis and transpiration intensity in the cotton shoots treated by it is eliminated by combined use of a TUR solution ( $10^{-3}$  percent concentration) and an IUK solution ( $10^{-4}$  percent concentration). References 9 (Russian)

2791/9716

CSO: 1840/2036

UDC 582.284

FACTORS AFFECTING SPORULATION OF ARMILLARIELLA MELLEAE IN BELORUSSIA

Moscow BIOLOGICHESKIYE NAUKI in Russian No 10, Oct 85 (manuscript received 28 Jun 84) pp 59-63

[Article by N. I. Fedorov, I.N. Bobko, V.M. Arnoldik and Yu.M. Poleshchuk, Chair of Wood Science and Forest Protection, Belorussian Technological Institute]

[Abstract] Determinations were made of the climatic conditions in Belorussia that affect sporulation of Armillariella mellea, in order to determine measures that may possibly be taken to prevent infection of conifers. Analysis of the biological characteristics of A. mellea demonstrated that, in Belorussia, sporulation occurs in summer (July to August) and in fall

(September to November). Circadian periodicity was evident, in that the largest number of spores are released from fruiting bodies in the daytime when the ambient temperature is ca. 15°C, in conjunction with a relative humidity of 85%, reaching 130,000 spores per 1 cm<sup>2</sup> of hymenophore area per 1 h. At night, with the temperature falling to 9°C, spore release falls to 30,000/cm<sup>2</sup>/h. A short-term freeze (-1°C) reduces the rate of spore dissemination to 2- to 4-thousand/cm<sup>2</sup>/h. Old fruiting bodies (7-8 days old) released 2- to 5-times as many spores as young bodies (4-5 days). Dissemination of the spores generally occurs via air currents, but in some cases insects--especially the *Placusa* beetles--have been implicated. Figures 2; references 11: 1 Polish, 3 Russian, 7 Western.

12172/9716  
CSO: 1840/2100

UDC 633.37+631.559

#### EFFECTS OF PLANT DENSITY IN YOUNG CHICKLING VETCH CROPS ON POTENTIAL AND ACTUAL PRODUCTIVITY

Moscow BIOLOGICHESKIYE NAUKI in Russian No 10, Oct 85 (manuscript received 5 Mar 84) pp 73-77

[Article by Ye.V. Turkova and V.A. Akhundova, Laboratory of Plant Developmental Biology, Moscow State University imeni M.V. Lomonosov]

[Abstract] Tabulated data are presented on the effects of plant density of young chickling vetch (*Lathyrus sativus*) crops on bud, flower, stolon, and fruit formation, in order to determine optimal cultivation parameters. The data invariably showed that higher productivity was evident with an inter-plant distance of 30 cm than with 15 cm. Thus, in the case of varieties Stepnaya-12, Belyanka and Stepnaya-287 the number of buds and flowers were greater by 24, 25 and 29%, respectively, in the former case. The corresponding increase in fruit formation with the 30 cm distance for these respective varieties was 23, 25 and 31%. Stolon formation was generally about 1.5-fold greater with the greater distance, while seed yields were increased by some 15%. Crop density was, therefore, seen to be a significant factor in planning high chickling vetch harvests. Figures 2; references 6 (Russian).

12172/9716  
CSO: 1840/2100

## EFFECTS OF COPPER AND NICKEL ON GROWTH REGULATORS IN WHEAT LEAVES

Moscow BIOLOGICHESKIYE NAUKI in Russian No 10, Oct 85 (manuscript received 9 Apr 85) pp 77-81

[Article by N.N. Kuznetsova and F.A. Tikhomirov, Radio-ecology Laboratory, Moscow State University imeni M.V. Lomonosov]

[Abstract] An analysis was conducted on the effects of soil levels of copper and nickel on growth stimulants and inhibitors in the leaves of Minsk wheat, using crops grown on continuously-cultivated and virgin, acidic, soddy-podzolic soil. In selected experiments copper was added to a level of 200 mg/ha and nickel to give 100 mg/ha, with the leaves analyzed by TLC for indolic and phenolic components and the extracts for activity on the growth of *Albidum* wheat coleoptiles. The effects of the metals were found to be complex, in view of the fact that both stimulated accumulation of growth inhibitors and inhibited the synthesis of growth stimulants such as auxin and its analogs. In general, however, accumulation of the growth inhibitors resulted in retarded development of the *Albidum* coleoptiles. It was further noted that the effects of soil supplementation with copper were dependent on the soil itself. Copper toxicity was less pronounced in the case of continuously cultivated soil due to dilution of copper by the other chemical elements, which had the net effect of raising the toxicity threshold. Figures 3; references 11: 10 Russian, 1 Western.

12172/9716

CSO: 1840/2100

## GROWTH-RELATED ACCUMULATION OF CHLOROPHYLL BY PHOTOHETEROTROPHIC RUBBER PLANT TISSUE CULTURES

Moscow BIOLOGICHESKIYE NAUKI in Russian No 10, Oct 85 (manuscript received 3 May 84) pp 81-85

[Article by M.V. Gusev, Ye.N. Markarova, N.N. Kirikova and D. Bilts, Chair of Plant Physiology, Moscow State University imeni M.V. Lomonosov]

[Abstract] Biotechnological interest in plant culture led to determinations of chlorophyll accumulation in tissue cultures of rubber plants (*Ficus elastica*, *Scorzonera* sp., *Apocynum venetum*, *Euphorbia tirucalli*, *Periploca graeca*), in order to determine factors activating such processes. Maximal biomass gain of the callus was obtained with a combination of blue + far red light, exceeding that obtained with white light by more than 2-fold. The combination of blue + far red light was almost as effective in stimulating the synthesis of chlorophyll a and b, whereas blue light alone stimulated chlorophyll synthesis to a third of the level seen with white light. Reduction

of the sucrose levels in the nutrient medium from 3% to 1% also potentiated chlorophyll synthesis, particularly in 26 to 42 day old cultures of *F. elastica*. These observations delineated some of the parameters that can be manipulated in rubber plant callus cultures, and which should have obvious significance in further development of this technology. Figures 2; references 9: 4 Russian, 5 Western.

12172/9716  
CSO: 1840/2100

UDC 579.23:579.22

#### MORPHOLOGICAL, PHYSIOLOGICAL AND BIOCHEMICAL CHARACTERISTICS OF CHITINASE-PRODUCING *AEROMONAS LIQUEFACIENS*

Moscow BIOLOGICHESKIYE NAUKI in Russian No 10, Oct 85 (manuscript received 27 Feb 84) pp 85-88

[Article by A.G. Chigaleyshik, Z.A. Arkadyeva and N.S. Yegorov, All-Union Scientific Research Institute of Applied Microbiology]

[Abstract] Studies were conducted on the cultural and physiological characteristics of *A. liquefaciens* when grown on meat-peptone-demineralized crab shell medium at 28°C, in order to further define this genus as a source of chitinase. Morphologically, the species under study met all the criteria applying to *Aeromonas* sp., as well as in its scope of biochemical reactions. Maximal biomass accumulation occurred in 16 h. *A. liquefaciens* produced two peaks of protease activity, the first occurring at 8 h and ascribed to uptake of readily assimilated protein components of the crab shell. The second peak occurred at 16 h and was ascribed to more extensive degradation of the shell. Beginning with the 8th h an exponential increase in the activity of chitinase was observed in the medium, reaching a maximal level by 12 h and remaining essentially at that plateau for the duration of growth (24 h). These characteristics of *A. liquefaciens* provide further proof for the contention that it is not a nonpigmented variant of *Serratia marcescens*. Figures 2; references 15: 5 Russian, 10 Western.

12172/9716  
CSO: 1840/2100

UDC 631.816.1:631.811.2:633.16

#### NITROGEN AND CARBOHYDRATE METABOLISM IN BARLEY IN RESPONSE TO DIFFERENT FORMS OF NITROGEN FERTILIZER

Moscow BIOLOGICHESKIYE NAUKI in Russian No 10, Oct 85 (manuscript received 23 Nov 84) pp 97-101

[Article by L.A. Lebedeva, Ye.V. Yegorova and Z.A. Rakhmatullina, Chair of Agrochemistry, Moscow State University imeni M.V. Lomonosov]

[Abstract] Studies were conducted on nitrogen and carbohydrate metabolism of Moscow-21 barley in response to fertilization with complete fertilizer (NPK) using both soluble and poorly soluble forms of nitrogen, to determine the

reasons for the general lack of effect of high fertilizer dosages. The 5-year study was conducted on dernovo-podzolic soil with replacement of a fraction of soluble nitrogen with urea-formaldehyde in the NPK composition, in doses of 0.1 to 0.3 g/kg of soil. The tabulated metabolic data clearly demonstrated that inclusion of urea-formaldehyde did not alter nitrogen uptake and metabolism by the plants, nor did it have a telling effect on carbohydrate metabolism. This would appear to account for the lack of effectiveness of high doses of mineral fertilizers, regardless of the form in which nitrogen is present. References 5 (Russian).

12172/9716

CSO: 1840/2100

UDC: 631.4

#### SOIL CLASSIFICATION IN AZERBAIJAN

Baku IZVESTIYA AKADEMII NAUK AZERBAYDZHANSKOY SSR: SERIYA BIOLOGICHESKIKH NAUK in Russian No 3, May-Jun 85 pp 29-36

[Article by G.Sh. Mamedov, Institute of Soil Science and Agrochemistry, AzSSR Academy of Sciences]

[Abstract] A discussion is presented of a long-term program for reclamation, improving the effectiveness of utilization of reclaimed land for more effective development of the food resources of the nation. Small-scale soil classification maps are now being constructed for Azerbaijan for the first time, indicating suitability for the soil for various crops. The purpose of this soil classification is to develop a single system of quantitative characteristics representing soil productivity and a single set of principles for composition of the nationwide Cadastre. Classification of soils in Azerbaijan is based on an ecological approach to the development of quality scales, broad conduct of specialized agro-ecological investigations in key areas and regions. Soil-quality classification studies can avoid unnecessary or fruitless expenditures on reclamation and soil improvement. Figure 1, references 14: Russian.

6508/9716

CSO: 1840/395

UDC: 633.16.631.523:575

#### LEVEL OF ESTIMATES OF COMBINATION CAPABILITY OF VARIETIES OF BARLEY AND TRANSGRESSIVE VARIABILITY IN SPLIT HYBRID GENERATIONS

Baku IZVESTIYA AKADEMII NAUK AZERBAYDZHANSKOY SSR: SERIYA BIOLOGICHESKIKH NAUK in Russian No 3, May-Jun 85, pp 60-69

[Article by I.D. Mustafayev, A.V. Alin Zade and E.D. Abbasov, Institute of Genetics and Selection, AzSSR Academy of Sciences]

[Abstract] Transgressive variability is one of the most important phenomena producing plants with new values of economically useful characteristics and properties. The appearance of genetic transgressions depends largely on

external conditions. Negative transgressions can also be of significance in selection work. In this article, the parameters of transgressions in  $F_2$  from diallele crossings of 5x5 varieties of barley are determined. The yield of transgressions by individual characteristics is traced as a function of the level of estimates and variance of combination capability. It is shown that parent pairs of all combinations with transgressions of one or several characteristics have high or moderate variance with respect to these characteristics, though not all combinations with high or moderate variance yield positive transgressions. Heredity of characteristics in the  $F_2$  combinations with transgressions was varied, from depression to superdominance, but plus transgressions usually appeared in combinations in which full or partial dominance of characteristics of the better parent or superdominance was noted. References 13: 7 Russian, 6 Western.

6508/9716

CSO: 1840/395

CURRENT ASPECTS OF TROPICAL MEDICINE

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 4,  
Jul-Aug 85 pp 3-8

[Article by V.P. Sergiyev, Main Administration of Quarantine Infections, USSR  
Ministry of Health, Moscow]

[Abstract] Alleging failure of colonial powers to deal with infectious and parasitic disease, hunger and malnutrition in what are now third world countries, the author summarizes achievements of Soviet health care as presented at an international conference on primary medical and hygiene aid, held at Alma Ata. He discusses the Soviet role in eliminating smallpox as a disease, claiming that the USSR provided more vaccine to the WHO and to individual countries than any other country. The article then turns to a discussion of tropical diseases, which supposedly are no different pathologically than those in moderate climates. Rather, their course may be more intensive. Specifically, tropical diseases mentioned include yellow fever, dengue fever, tropical viral hemorrhagic fevers, and others. Other diseases that are sometimes labeled tropical (such as malaria, leprosy and meningitis), are also found outside tropical areas. Public health programs and economic programs with public health components, such as pure drinking-water programs, are being carried on in the tropics, and Soviet consultants have been brought in by many countries. A serious problem for third world countries is the influx of the rural populace into cities, which as a result, become instant slums, and breeding places for diseases. Programs to eliminate epidemic diseases have often failed due to insufficient financial and human resources. A special problem is in assuring health to temporary residents and preventing them (or others) from carrying tropical diseases to their home countries.

12131/9716  
CSO: 1840/1103

STATE AND PROSPECTS OF SCIENTIFIC RESEARCH AND TRAINING OF PERSONNEL IN TROPICAL MEDICINE IN USSR

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 4, Jul-Aug 85 (manuscript received 30 Jan 85) pp 8-15

[Article by L.S. Yarotskiy and A.S. Khromov, Institute of Medical Parasitology and Tropical Medicine imeni Ye. I. Martsinovskiy, USSR Health Ministry, Moscow]

[Abstract] The numbers of third world medical personnel have grown (including many trained in the USSR), but the gap in physicians per capita between third world countries and European countries is enormous, while as many as 210 million people in the tropics suffer from malaria, 250 million from forms of filariasis, and 200 million from schistosomiasis. The USSR also has endemic parasitic diseases such as leishmaniasis. In addition, Soviet personnel going to tropical countries need protection from diseases they may face abroad. For all these reasons, research in tropical diseases has been an item of high priority in the USSR, with notable successes, for example, in controlling *Filaria medinensis* in Uzbekistan, cutaneous leishmaniosis in the Transcaucasus and Central Asia, and other ailments. Broad cooperation is being carried on with CEMA countries in further work to combat such diseases, with special emphasis on malarial strains that are resistant to chemical agents. Soviet participation in the World Health Care Assembly focused on malaria, leishmaniosis, onchocercosis immunology, leprosy, and control of carriers of diseases. Special interest is also devoted to possible importers of tropical diseases into the USSR. Organization and coordination of research, education and practical implementation of new measures against tropical diseases are key areas for Soviet efforts in the coming years. References 40: 37 Russian, 3 Western.

12131/9716  
CSO: 1840/1103

UDC 616.936-008.97-085.283.926-036.8

EFFECTIVENESS OF USING CHLOROQUINE FANSIDAR AND DABECHINE FOR TREATING PLASMODIUM FALCIPARUM CARRIERS LIVING IN HYPERENDEMIC MALARIA SITE (CITY OF BAGAMOYO, NORTHEASTERN TANZANIA)

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 4, Jul-Aug 85 (manuscript received 24 May 84) pp 15-19

[Article by R.L. Kuznetsov, V. Kilama, D. Peyn, S.S. Campbell, J. Story and S. Kikhamiya, Institute of Medical Parasitology and Tropical Medicine imeni Ye. I. Martsinskiy, USSR Health Ministry, Moscow]

[Abstract] Discovery in a U.S. citizen of a strain of *Plasmodium falciparum* resistant to chloroquine led authors to make an initial study of that strain. The present article reports on further study of chloroquine designed to

provide lasting elimination of *P. falciparum* from the blood of carriers and determine the effectiveness of combinations of pesticides on local strains of tropical malaria, as well as that of Soviet dabechine. Results showed that chloroquine effectively eliminated 89% of the parasites, fansidar was 100% effective and dabechine only 47% effective. It was possible to increase dabechine doses from 10 mg/kg to 25 mg/kg of body weight, and thereby eliminate *P. falciparum* parasites that had become sensitive to chloroquine. References 11: 2 Russian, 9 Western.

12131/9716  
CSO: 1840/1103

UDC 616.89-008.441.13-06:616-036.17-02

RISK FACTORS IN APPEARANCE OF MALIGNANT TROPICAL MALARIA IN SOCIALIST REPUBLIC OF VIETNAM. REPORT 2. COMPARATIVE FEATURES OF COURSE OF TROPICAL MALARIA IN DRUG ADDICTS AND NON-ADDICTS

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 4, Jul-Aug 85 (manuscript received 3 Feb 84) pp 25-27

[Article by A. M. Shcherbakov, N. N. Ozeretskovskaya, Chin Kim An, Vu Thi Fan, Nguen Thi Ny Mai, Le Nguen Bin, S. A. Rabinovich, Nguen Hu Dyk and Vu Thi Tuet, Institute of Medical Parasitology and Tropical Medicine imeni Ye. I. Martsinovskiy, USSR Ministry of Health, Moscow; Institute of Malariology, Parasitology and Entomology, Socialist Republic of Vietnam, Hanoi, Chorey Hospital, Ho Chi Minh City]

[Abstract] The severity of malaria cases depends on immunological, hereditary and other factors. Narcotics addiction has been found to be among the latter, causing significant exacerbation of the disease's course. The present article reports on a comparative study of drug addicts and non-addicts suffering from malaria. A group of 10 addicts 20-47 years of age suffering from cerebral malaria, and 32 non-addicts, were compared over their period of treatment in the hospital, which began with quinine at 10 mg/kg twice a day, with limited liquid consumption. Intramuscular fansidar was also given once daily. The quinine treatment was continued for 10 days, the fansidar for 3. Other procedures included administration of deperzolon and lasix, as well as blood transfusions. While 29 of the 42 subjects showed marked improvement, 4 of the 10 addicts and 9 of the 32 non-addicts died of the disease. Results showed that non-addicts had less severe comas and in general showed better adaptation of the central nervous system, and better immune responses, to the malignant malaria than did those with a history of drug addiction. References 5: 1 Russian, 4 Western.

12131/9716  
CSO: 1840/1103

## STUDY OF ECONOMIC IMPACT OF ZOONOTIC CUTANEOUS LEISHMANIASIS IN UZBEK SSR

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 4, Jul-Aug 85 (manuscript received 24 Sep 84) pp 44-48

[Article by Sh. M. Zhakhangirov and L. N. Krasnonos, Scientific Research Institute for Medical Parasitology imeni L. M. Isayev, UzSSR Ministry of Health, Samarkand]

[Abstract] The economic impact of epidemics has been given greater importance in recent years. The present article reports on assessment of the economic cost of zoonotic cutaneous leishmaniasis (ZCL), which is widespread in Central Asia and Kazakhstan. The authors calculated the economic cost per case of ZCL, including medical (direct) costs, and losses related to incapacitation for work. Data indicated that with hospitalization, lost work-time averaged 23 days, while with out-patient care, it ranged from 3 to 20 days. Regional hospital costs of 5.22 rubles per day and out-patient costs of 88 kopecks per visit, were added to net daily product figures ranging from 16.37 to 33.82 rubles; the overall average cost per case of ZCL was set at 13.54 rubles in direct costs and 95.47 in indirect costs. Thus the annual economic impact of ZCL in Uzbekistan was 110,000 rubles in the period of 1973-1983. On the other hand, the authors calculated that prevention would cost 8.22 rubles per case. References 11 (Russian).

12131/9716

CSO: 1840/1103

UDC 616.9-022.913-084.4

## BASIC PRINCIPLES OF PROTECTION FROM IXODIDE TICKS AND BLOODSUCKING FLIES IN BAIKAL-AMUR RAILWAY ZONE

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 4, Jul-Aug 85 (manuscript received 6 Apr 84) pp 64-67

[Article by V. P. Ipatov, All-Union Scientific Research Institute for Disinfection and Sterilization, USSR Ministry of Health, Moscow]

[Abstract] The article reports on ecologically sound means of protecting construction workers and residents in the Baikal-Amur Railway zone from ixodide ticks and bloodsucking flies during the 9 years of the construction project. The focus is on the insects themselves, rather than the main specific disease each may carry, because the author believes that other harmful organisms are also carried into humans by these insect bites, they cause allergies, and reduce labor productivity by irritation of workers. The unique ecology of the BAM zone and the lack of previous studies of insecticides and repellants contributed to the difficulty. Eventually, general repellants and insecticides, as well as mechanical means such as screening and protective clothing, were used to protect humans in the area. DDT was not used because of the small but numerous sites; rather, organophosphorus compounds with safer ecological parameters were employed. Efforts were also made to create "insect-free" zones in the work areas. References 19 (Russian).

12131/9716

CSO: 1840/1103

EFFECT OF CERTAIN BIOTIC FACTORS ON COXIELLA BURNETTI INFECTION RATE OF ORNITHODOROS PAPILLIPES. REPORT 2. SIGNIFICANCE OF AGENT STRAIN VARIATIONS FOR EFFECTIVE TICK INFECTION

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 4, Jul-Aug 85 (manuscript received 27 Jun 84) pp 68-71

[Article by A. B. Dayter, Institute of Epidemiology and Microbiology imeni Pasteur, Leningrad]

[Abstract] Variations in susceptibility to tick-borne encephalitis have been noted in previous reports. The present article reports on study of *C. burnetti* strains of *Ixodes* IV-Luga from humans, rodents and other ticks, which were used to infect *O. papillipes* ticks in two phases of development. Ticks were more susceptible to tick-borne pathogens than to those from humans, but no difference was noted between tick- and rodent-borne *C. burnetti* strains. The post-embryonic phase of development was more potent than the earlier phase, and the duration of infection and amount of blood ingested by subject ticks also affected the likelihood of infection. A further factor was the combined impact of *Rickettsia* in the host and feeding cycle stage in the ticks. While the test ticks were 1.4 times as susceptible to tick-borne infection as to human-borne pathogens, no other significant differences were noted. References 8: 7 Russian, 1 Western.

12131/9716  
CSO: 1840/1103

CIRCULATION OF YERSINIA ENTEROCOLITICA IN SAMARKAND

Tashkent MEDITSINSKIY ZHURNAL UZBEKISTANA in Russian No 2, Feb 86 (manuscript received 17 Sep 85) pp 32-33

[Article by S.Kh. Vafakulov, M. Ya. Sharipova and O. Yu. Ivashkina, Chair of Pediatric Infectious Diseases, Samarkand Order of People's Friendship State Medical Institute imeni I.P. Pavlov]

[Abstract] Extensive epidemiological studies were conducted on clinical cases, medical personnel, food products (milk, vegetables) and fomites to ascertain the circulation of *Yersinia enterocolitica* in Samarkand. The resultant bacteriological and serological studies demonstrated that all known serovars (03, 05, 06, 08, 09) circulate in the city, but that the majority of the isolates belonged to the 06 and 09 serovars. The strains were susceptible to levomycetin, streptomycin, kanamycin and monomycin, but resistant to penicillin. Most of the clinical cases occur in the form of acute intestinal infections, with children 1 to 3 years old evidencing particular susceptibility.

12172/9716  
CSO: 1840/2107

# EPIDEMIOLOGIC CHARACTERISTICS OF RODENTS SERVING AS CARRIERS OF HUMAN BACTERIAL PATHOGENS

Tashkent MEDITSINSKIY ZHURNAL UZBEKISTANA in Russian No 2, Feb 86 (manuscript received 10 Apr 85) pp 42-44

[Article by T.R. Radzhapov, I.A. Kozlov, V.N. Davydov and M.M. Khakimov, Uzbek Antiplague Station]

[Abstract] Between 1976 and 1984 some 10 thousand rodents collected at oases in Uzbekistan were subjected to bacteriologic studies at the Uzbek Antiplague Station. The bacteriologic studies were complemented by pathogenicity studies on white mice, and demonstrated that such rodents harbor a variety of human pathogens. In view of the high degree of contact between humans and such rodents, the latter obviously present a risk factor to human health. The spread and distribution of these carriers bears further monitoring, complemented by the development of appropriate preventive and antiepidemic measures in high-risk areas. References 3 (Russian).

12172/9716

CSO: 1840/2107

UDC 616.988.21:59

# DISTRIBUTION OF RABIES IN VORONEZH OBLAST IN RELATION TO SOIL AND GEOLOGICAL CONDITIONS

Moscow BYULLETEN' MOSKOVSKOGO OBSHCHESTVA ISPYTATELEY PRIRODY: OTDEL BIOLOGICHESKIY, Vol 91, No 1, Jan-Feb 86 (manuscript received 13 Jul 83) pp 3-7

[Article by S. A. Kurolap, Yu. M. Skorokhodov, Ye. V. Rotshild, V. R. Krasilnikov and N. T. Barvitenko]

[Abstract] Little study has previously been made of soil and geological factors in relation to rabies outbreaks, other than general notes that in the Ukraine, Omsk and Bryansk oblasts, forest steppe is a common site. The present article reports on study in Boronezh Oblast to define the role of soils and other geological and natural factors in occurrences of rabies. The territory was divided into districts 30 X 30 km in size, and the history of rabid animals in each as well as its geological peculiarities were determined. Factors included soil type (limestone, chalky, marl, various sands, etc.), waterways and ground water, land use, contour, etc. Results indicated that zones with reduced annual water amounts (both from rainfall and from springs, permanent water bodies, etc.) were likely to suffer the greatest number of rabies cases. Also, carbonate soils and chalky or marl soils were highly correlated to outbreaks of rabies. Although tectonic irregularities were not so clearly connected, they seemed also to indicate rabies foci. Apparently carbonate, and especially chalky soils tends to preserve the rabies virus better than other soil types. It was also noted that the optimum pH for preserving the virus was 7.6, although no clear correlation could be drawn. Figure 1; references 13: 12 Russian, 1 Western.

12131/9716

CSO: 1840/2030

## RESPIRATORY-SYNCYTIAL VIRAL INFECTION

Minsk ZDRAVOOKHRANENIYE BELORUSSII in Russian No 1, Jan-Feb 86 (manuscript received 18 Jun 85) pp 42-44

[Article by S. V. Khlyustov, P. G. Rytik and I. I. Kucherov, Belorussian Scientific-Research Institute of Epidemiology and Microbiology]

[Abstract] Respiratory-syncytial viral diseases are highly infectious, attacking primarily lower respiratory pathways of children up to four years of age. RS virus retains its strength in saliva from 20 min to 6 hrs; at 55° C it loses its infectious power in 5 min and at 37° C in 24 hrs. The incubation period is 3-7 days and humans are the only carriers of RS virus. It is spread globally. This virus was noted among children in Minsk. The predominant symptoms were bronchitis, bronchiocytes and bronchopneumonia with dyspnea, coughing and nasopharyngitis. The temperature was normal to slightly elevated. Recently the "sudden death syndrome" was reported. One-third of the inspected children showed presence of RS virus. RS virus is spread by air and direct contact, most of the infections occurring in late autumn-winter season. It is more prevalent among high density city dwellers than in the country. At this time there is no vaccine available for preventive measures. Interferon was tried as a possible protector for the very young ones. Hand washing, face masks and frequent changing of the clothing were recommended for personnel working with sick and healthy children along with isolation measures for the patients. References 13: 7 Russian, 6 Western.

7814/9716

CSO: 1840/2001

UDC 616.981.718-089.07

## Q FEVER CASE

Minsk ZDRAVOOKHRANENIYE BELORUSSII in Russian No 1, Jan-Feb 86 (manuscript received 16 Apr 85) p 76

[Article by V. F. Terentyev, Ye. N. Ishina and M. M. Ishin, Department of Infectious Diseases, Voronezh Medical Institute imeni N. N. Burdenko]

[Abstract] Only a few cases of Q-rickettsiosis with "acute stomach" are described in literature. A Q-fever case is reported. An agriculturist, 39 years old, was admitted with complaints of headache, weakness, muscular pain and temperature of 39.5° C. Acute pyelonephritis was suspected. Clinical data on admission were uneventful; administration of penicillin did not help, the symptoms continued. No pathogenic flora was found and typhus, malaria, brucellosis and tularemia were excluded. On the 13th day, pain on palpation was noticed in the right subcostal margin, which intensified in time. Acute cholecystitis was suspected. Monomycin, spasmolytics and diet were prescribed and on the 19th day laparotomy was performed showing normal gall bladder, pancreas and liver. Biopsy of liver showed fatty dystrophy and nodal hepatitis.

Post-operative recovery was uneventful and no improvement was noted. Levomycetin was administered. The patient was transferred to the department of infectious diseases. On the 34th day levomycetin was stopped. Q-fever was diagnosed after a positive Bernet test. The unique aspect of this case was the late appearance of specific antibodies in blood and atypical pain in the right subcostal margin which led to surgical intervention. References 3 (Russian).

7813/9716

CSO: 1840/2001

UDC 633.15.002.611

COMPARATIVE UV-SPECTROPHOTOMETRY OF MAIZE PROTEINS

Krasnodar IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: PISHCHEVAYA TEKHNLOGIYA  
in Russian No 5, Sep-Oct 85 (manuscript received 7 May 84) pp 14-17

[Article by A.N. Vinnichenko, V.S. Fedenko, O.G. Mirosh and I.V. Shenkarenko,  
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[Abstract] A comparative analysis was conducted on the grain proteins of nine varieties of conventional and high-lysine maize using UV-spectrophotometry, to assess the value of this technique in revealing differential characteristics. Graphical and tabulated data are summarized on the UV spectra of total proteins and the absorption wavelengths, extinction coefficients, and  $D_{260}/D_{280}$  and  $D_{280}/D_{220}$  ratios for the albumin, globulin, zein and glutelin fractions. The results demonstrated that UV-spectrophotometry reflected the heterogeneity of the storage proteins between the conventional and high-lysine varieties, and thus served as a convenient method of assessing mutants. Figures 1; references 10: 8 Russian, 2 Western.

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PIPE-LINE TRANSPORT OF GROUND KRILL

Krasnodar IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: PISHCHEVAYA TEKHNLOGIYA in  
Russian No 5, Sep-Oct 85 (manuscript received 2 Apr 84) pp 78-80

[Article by A.L. Fonarev, O.K. Bogolyubskiy, B.N. Anikin and M.A. Pinchuk,  
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[Abstract] Studies were conducted on the feasibility of ground krill transfer in a ship-to-ship setting using a pipe-line. Analysis of the rheologic characteristics of ground krill obtained by extrusion through 0.003 m openings showed that at temperatures of  $-3^{\circ}\text{C}$  or greater the product behaved as a

Bingham visco-elastic body. At flow rates of 0.8 m/sec or less and  $d = 0.06$  m the product exhibited laminar flow, indicating that diaphragm-type pumps were suitable for propelling the mass. Figures 3; references 8 (Russian).

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#### MICROCOMPUTER-BASED AUTOMATIC CONTROL SYSTEM FOR MONITORING BULK FOOD PRODUCTS

Krasnodar IZVESTIYA VYSSHIKH UCHEBNYKH ZAVEDENIY: PISHCHEVAYA TEKHNLOGIYA in Russian No 5, Sep-Oct 85 (manuscript received 30 Nov 84) pp 103-106

[Article by V.V. Skugarev and B.F. Filyakin, Chair of Computer Technology and Industrial Electronics, Voronezh Technological Institute]

[Abstract] cursory description is provided of a microcomputer-based system for quality control of dough at baking plants, involving monitoring of dough parameters (pH, temperature, water content, acidity) via sensors. The advantage of the designed system is that it bypasses the need for a terminal and relies on the small (380 x 501 x 100 [sic], 15 kg) microcomputer Elektronika-60. The entire control system itself can be incorporated as a subsystem into closed automatic control systems, and changes in technology can be accommodated by a change in the program. Figures 1; references 14 (Russian).

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#### BACTERIOLOGICAL STANDARDIZATION OF FOOD PRODUCTS

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 9, Sep 85 pp 25-27

[Article by L.I. Kalamkarova, K.I. Bilyalova, R.M. Rakhimberlina, N.B. Mendygaleyeva, L.A. Ilchenko, T.A. Kasymbekova and D.I. Kurmangaliyeva, Kazakh Branch, Institute of Nutrition, USSR Academy of Medical Sciences, Alma Ata]

[Abstract] Bacteriological studies were conducted on a number of meat and dairy products in Kazakhstan to set permissible bacterial levels. On the basis of extensive examinations in relation to total counts, speciation, and sources of contamination the upper limit for sausage products was set at  $3 \times 10^3$  cells/kg for mesophilic aerobes and facultatively anaerobic bacteria. The presence of coliforms is not allowed in such products. The maximal allowable counts for coliforms in sour cream and pot cheese were established at  $10^3$  to  $10^4$  cells/kg. The study also led to the conclusion that enterococcal counts in mare's and camel's whole milk should not exceed  $10^5$  cells/ml, nor  $10^4$  cells/ml in koumiss or shubat.

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## GENETICS

UDC 633.14:576.312.36

### SELF-POLLINATION AND FEATURES OF MEIOSIS IN SELF-POLLINATING VARIETIES OF SECALE CEREALE L. RYE

Tallinn IZVESTIYA AKADEMII NAUK ESTONSKOY SSR: BIOLOGIYA in Russian Vol 35, No 1, Jan-Mar 86 (manuscript received 15 Jan 85) pp 33-37

[Article by Tamara Shnayder, Tatyana Fadeyeva, Igor Surikov and Natalya Romanova, Institute of Experimental Biology, ESSR Academy of Sciences; All-Union Scientific Research Institute imeni N. I. Vavilov; Leningrad State University]

[Abstract] Self-pollinating rye *Secale cereale* L. and its potential in developing hybrids are reported. Various irregularities in the meiosis of rye-wheat hybrids were previously demonstrated, and consequently cytogenetic studies were carried out to determine features of sterile versus self-pollinating strains. Descendents of a single winter rye 'Vyatka' plant clone, including strains D-522, D-528, D-535, D-537, D-541 and D-545, were studied to see effectiveness of pollination and growth after sprouting. Cytological analysis showed that the highest number of mother cells in the pollen was found in D-545, D-522 and D-533 (10.6, 0.9 and 0.7%, respectively). The feature of heterozygoticity in translocation was found to be a structural characteristic of the karyotype. The test strains did not become autogamate, but preserved the genetic system of the cross-pollinated original plant. They retained vitality and fertility despite cloning. References 12: 5 Russian, 7 Western.

12131/9716

CSO: 1840/2035

### DEVELOPMENTS IN GENETIC ENGINEERING

Moscow KHIMIYA I ZHIZN in Russian No 3, Mar 86, pp 16-19

[Article by A. Iordanskiy (recorder)]

[Abstract] Report of an interview with the Director of the All-Union Scientific Research Institute of Genetics and Selection of Industrial Microorganisms, V. G. Debabov is given. Debabov reviewed the progress in genetic engineering research during the past five years. The story began

with synthesis of threonine; selecting *E. coli* was the starting microorganisms, it was possible to produce 50 g of threonine per liter of the medium in 40 hrs. The second success was achieved in production of riboflavin. *Bacillus subtilis* was selected as the microorganism into which an operon responsible for synthesis of riboflavin was inserted by genetic engineering techniques. On this basis it was possible to produce 4 g of riboflavin per liter of the medium in 35 hrs of fermentation. In the near future, production of aspartylphenyl-alanine methyl ester is projected. Two amino acids are crucial in this process: aspartic acid and phenylalanine; in both cases, Debabov's institute has had considerable expertise.

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UDC 576.851.49.097

CYTOTOXICITY OF AUTOANTIBODIES INDUCED BY ADMINISTRATION OF VARIOUS TYPHOID VACCINES

Tashkent MEDITSINSKIY ZHURNAL UZBEKISTANA in Russian No 2, Feb 86 (manuscript received 12 Apr 83) pp 60-61

[Article by N.N. Sheremetyev, Tashkent Scientific Research Institute of Vaccines and Sera, USSR Ministry of Health]

[Abstract] Studies with rabbits were conducted to determine the cytotoxicity of autoantibodies resulting from immunization by various typhoid vaccines. A single immunization of rabbits with a cellular vaccine was accompanied by the appearance of autoantibodies that reduced oxygen uptake by rabbit hepatic mitochondria by 35.3%, whereas serum from nonimmunized, control rabbits was without effect. Rabbits immunized with trypsin-treated chemical vaccine generated autoantibodies that had a less inhibitory effect, with the oxygen consumption amounting to 77.3% of the control level. Least inhibition was effected by autoantibodies generated in response to immunization with a whole chemical antigen, with retention of 83.8% of the control oxygen uptake. It appears, then, that cellular typhoid vaccines induce the generation of very aggressive autoantibodies in the rabbit, whereas the least damaging autoantibodies are induced by the whole chemical antigen. References 7: 6 Russian, 1 Western.

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CSO: 1840/2107

UDC 613.63:666

EFFECTS OF WORKING CONDITIONS ON PHYSIOLOGICAL STATUS AND TEMPORARY DISABILITY  
AT GLASS FACTORY

Baku AZERBAYDZHANSKIY MEDITSINSKIY ZHURNAL in Russian No 12, Dec 85 pp 5-9

[Article by A.D. Mamedova and M. Ye. Nabiyeva, Chair of Labor Hygiene and Occupational Diseases, Azerbaijan Order of the Red Banner of Labor State Medical Institute imeni N. Narimanov]

[Abstract] An assessment is made of the hygienic aspects of the working conditions at a glass factory, using a cohort of 25 individuals that had an employment history of 7-10 years at the plant, and who ranged in age from 25 to 45 years. Generally speaking, at the end of a shift there were no significant deviations from the norm in physiological parameters depicting the status of the cardiovascular, respiratory, or the muscular systems. The key factors affecting comfort and health were identified as elevated temperatures ( $24.8 \pm 0.5^{\circ}\text{C}$ ), high humidity ( $73.8 \pm 4.1\%$ ), and elevated concentrations of quartz dust ( $2.1-8.7 \text{ mg/m}^3$ ) and CO ( $86.1 \text{ mg/m}^3$ ). Additional adverse factors were the manual routines and unnatural body postures required of some of the operations. Analysis of morbidity patterns for the years 1981-1983 showed that respiratory diseases accounted for 41.7-47.5% of the cases of temporary disability, cardiovascular problems for 12.5-14.5% of the cases, and skeletal-muscular disorders for 6.4-9.8% of the morbidity. Better ventilation, heat control, and automation would obviously be significant in improving the health environment at the factory. Figures 1; references 15: 14 Russian, 1 Polish.

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## HEPATIC TOXICITY IN CHRONIC OCCUPATIONAL EXPOSURE TO PHOSPHORUS

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 3, Mar 85 pp 44-48

[Article by B.N. Aytembetov, G.I. Beloskurskaya, R.M. Balmakhayeva and Ya.G. Paraskevopulos, Scientific Research Institute of Regional Pathology, Alma-Ata]

[Abstract] Extensive clinical and laboratory studies were conducted on 204 patients with chronic phosphorus intoxication, with 197 subjects presenting with hepatitis as the primary symptom. The group, male and female, ranged in age from 20 to 50 years, with 5 to 15 years of employment in the production of yellow phosphorus. Hepatitis manifested either as a persistent or progressive lesion, with inflammatory biliary tract involvement in 20% of the cases and dyskinesia in 44%. The biochemical studies indicated derangement of protein and lipid metabolism, with concomitant cytelysis, cholestasis, functional insufficiency, and general diffuse parenchymal involvement. Termination of contact with yellow phosphorus and its compounds led, as a rule, to gradual recovery of hepatic function. However, in severe cases with an active inflammatory process, chronic hepatitis was the rule. In rare cases postnecrotic cirrhosis developed. References 4 (Russian).

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CSO: 1840/2026

UDC 613.632/.633

## TOXICOLOGICAL STUDIES ON MAGNESIUM AND ALUMINUM MAGNIDE DUST AND AEROSOL FORMED IN WELDING OF MAGNESIUM-ALUMINUM ALLOYS

Kiev VRACHEBNOYE DELO in Russian No 2, Feb 86 (manuscript received 17 Jan 85) pp 105-108

[Article by L.N. Gorban and T.M. Borodyuk, Laboratory of Labor Hygiene in Electric Arc Welding and Toxicology of Welding Aerosols, Kiev Scientific Research Institute of Labor Hygiene and Occupational Diseases]

[Abstract] Albino rats were employed in a study to determine the relative health risk of magnesium and aluminum magnide dust and of aerosols formed in the welding of magnesium-aluminum alloys. The rats were exposed to intra-tracheal administration of Mg dust (MG-1, 99% Mg), magnesium-aluminum alloys dust (AMG-6), aluminum magnide  $Al_{12}Mg_{17}$  dust, or aluminum magnide  $Al_3Mg_2$ . AMG-6 was in the form of a condensation aerosol with 95% of the particles smaller than  $1 \mu m$ , while the other 3 aerosols consisted of particles  $2-5 \mu m$  in size. A common feature of all 4 aerosols was that they induced a weak fibrogenic effect in the lungs, with the effects of MG-1 being the most pronounced (as indicated by the highest increase in the concentration of hydroxyproline). Systemic toxicity was also a factor, and was a more serious problem with MG-1 and AMG-6 than with  $Al_{12}Mg_{17}$  and  $Al_3Mg_2$  (although in the latter two agents the percentage of Mg was 56 and 37.5%, respectively). These findings indicate that in addition to percentage composition, toxicity was also predicated on the crystalline structure of the compounds and alloys. References 7 (Russian).

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## LASER BIOEFFECTS

### NEW DATA ON LASER USE IN SURGERY (REPORT 1)

Ashkhabad IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR: SFRIYA BIOLOGICHESKIKH NAUK  
in Russian No 5, Sep-Oct 85 (manuscript received 30 Oct 84) pp 51-58

[Article by O.G. Babayev, Kh.F. Babayev, and B.N. Tachmuradov from the Turkmen State Medical Institute]

[Text] Up to now voluminous material has been accumulated on using the laser beam in medicine. There are no doubts that the laser has become an integral tool in the important stages of operations, plastic surgery, etc. Many surgeons have become convinced of the hemostatic, incision, and evaporation properties of continuous-wave lasers. All of this has made it possible to introduce them into surgery, dermatology, gynecology, oncology, and other branches of medicine.

In 1977 a 300-bed laser center that was equipped with 3 Sharplan-743 (70 W) lasers, two CO<sub>2</sub> lasers of French production, and two YAG lasers of 100 W each for endoscopic operations was created in France. In this center (Sultan et al, 1981) laser operations are performed in abdominal and chest surgery, dermatology, and orthopedics. L. Kaplan (1982) believes that the laser is irreplaceable in treating patients with hemophilia and thrombocytopenia, as well as individuals receiving heparin and dicoumarol. Lasers are used to perform operations on tumors of the mammary glands, to perform liver and kidney resections, and to remove vascular tumors. The property of lasers to coagulate the lymphatic vessels and, consequently, to prevent the dissemination of the operational field of malignant cells makes it effective to use them in oncological surgery. At the Moscow Scientific Research Institute imeni P.A. Herzen, the coagulating properties of laser radiation have been widely used with various tumor processes on the skin and mucous membranes. Recurrences constituted 2 percent [7]. Thus, Takiguchi et al (1981) have observed the use of the laser during hemorrhagic syndrome. Blood loss was minimal in all cases. Blood loss was computed during mastectomy using an ordinary scalpel ( $468 \pm 127$  mL), an electric scalpel ( $146 \pm 35$  mL), and a laser ( $110 \pm 23$  mL). Blood loss during a laparotomy when the patient had a tendency toward hemorrhage was  $42 \pm 5$  mL using the ordinary procedure and  $36 \pm 8$  mL using a laser.

The studies showed that during the effect of an argon laser, injured erythrocytes release a strong mediator of thrombocyte agglutination (Corisch, Doergen,

1980). Conditions for the protracted closing of the lumen of the vessel are created, and the formation of fibrin is an additional stabilizing moment for thrombosis.

Significant results have been attained in the surgical treatment of diseases of the gastrointestinal tract using the laser method.

More than 500 operations on the esophagus and stomach using laser technology have shown the advantage of the new method [10-13]. Dissection of the walls of the genital organs occurred bloodlessly and aseptically. The phenomenon of "laser welding" of biological tissues, the fixation of the layers of the genital organ's wall, makes it possible to make a single-layer suture for anastomosis, prevents hemorrhage, and turns the mucous membrane inside out.

Comparative evaluation of various methods of intestinal suture when forming anastomoses using a CO<sub>2</sub> laser under conditions of experimental peritonitis showed its superiority over the usual application of sutures (Ye.I. Brekhov et al, 1984). Using laser technology makes it possible to simplify the formation of anastomoses with any method of intestinal suture and reduces traumatization of the tissues and, consequently, infection of the intestinal wall, which significantly improves the mechanical strength and biological sealing and accelerates the anastomosis regeneration process. All of this is achieved because of the properties of the laser beam: asepsis, bloodlessness when make an incision into tissues, the "biological welding" effect, and the possibility of sealing the rear semicircumference of an anastomosis with a coagulation crust.

Histological studies conducted after 2 weeks indicated the growth of serosae and muscle and submucous layers. Twenty to 40 W of laser power is necessary for operations on the stomach and intestines.

Treating the early stages of cancer and stomach polyposis has made it possible to achieve good results after using a laser (Muzushima et al, 1981). When treating chronic stomach ulcers, Harada et al, 1981, used endoscopically local injections of steroids and alantoin. The healing process of the ulcers was accelerated by irradiating them with a YAG laser, and even ulcers not subjected to drug therapy healed.

The great experience in planned operations using lasers in surgery on the gastrointestinal tract has made it possible to introduce laser technology to extraneous surgery on the abdominal organs. Operations involving a laser scalpel in stomach surgery (28 operations) have yielded good results: absence of failure of the sutures of the anastomosis, hemorrhage into the lumen of the abdominal organs, and fatal outcomes (O.K. Skobelkin et al, 1983). Harada (1981) used a laser with a power up to 50 W to irradiate the edges of a chronic ulcer in seven patients (three to four sessions with an exposure of 1 second). No recurrence was observed. The functional state of the stomach after resection using a laser scalpel according to Billroth II, with the opening of the jejunum along the countermesentery edge when forming the anastomosis, prevents the reflux of its contents, which leads to the atrophic process. Roentgenological and gastroscopic studies have shown that a narrow gastrointestinal anastomosis with a diameter of 2.0 to 2.5 cm does not impair the evacuation of

the stomach's contents in the immediate postoperative period and prevents the reflux of the stomach's contents in later periods.

Endoscopic and roentgenological studies conducted in the immediate postoperative periods have not uncovered any differences between single- and double-layer seams using a laser, either in the times or nature of the healing of the wounds after pyloroplasty or in the motor-evacuatory function of the stomach (V.K. Protasevich and E.A. Yazvinskiy, 1984). However, using laser technology in pyloroplasty makes it possible to operate more aseptically, bloodlessly, and accurately as a result of the absence of the labialization of the mucous membrane along the line of the incision.

Using a laser scalpel in the fundamental stages of a gastrectomy has made it possible to carry out the operation more perfectly and to prevent the development of a number of complications in the immediate and later periods after the operation (Ye.I. Brekhov et al, 1984). Endoscopic testing and roentgenological study of patients for 15 days following the operation revealed good healing dynamics of the gastroenterostomy. Only in isolated cases were anastomoses observed in the course of the first year following release from the hospital.

The use of CO<sub>2</sub> lasers in patients with malignant tumors of the digestive organs provided rapid and bloodless incision of the walls of the abdominal organs (E.M. Tsarev and M.M. Klimov, 1984). The absence of hemorrhage from the walls of the organ and the asepsis of the operation provide primary adhesion. The authors obtained a positive hemostatic effect in cases using a defocused laser beam to stop capillary hemorrhage from the parenchymatous organs.

Study of the possibilities of using a CO<sub>2</sub> laser to remove the mucous membrane of the hollow organs of the digestive tract attests to the advantages of this method over traditional procedures (Ye.I. Brekhov et al., 1982-1984). Removal of the mucous membrane is technically simplified by using a deformed beam. The intervention proceeds bloodlessly. Morphological studies of the demucosified stomach flap, which is used to cover a defect in the stomach wall, reveal high plastic properties. The problem of applying sutures when forming anastomoses is a fundamental and unresolved issue in surgery on the stomach, duodenum, and intestine, etc. Experimental and clinical studies (V.P. Pashilov et al., 1982 and 1984), which were based on microscope studies and tests for pressure and rupture, computation of the index and photography, and endoscopy and morphological study in a clinical setting revealed significant advantages of the single-layer anastomoses over the double-layer traditional sutures that are widely used in abdominal surgery. The anastomosis is easily formed and occurs bloodlessly and aseptically on account of the coagulating features of laser radiation. The maximal sparing of tissues is achieved, and the inflammation process is insignificant. Deformation of the anastomosis is minimal. The absence of edema and deformation has made it possible to form narrower anastomoses in a clinical setting, significantly decreasing dumping phenomena.

Laser therapy (with a power of 1 mW) of the stomach and duodenum during endoscopic study is an effective means in the complex therapy of gastroduodenal ulcers. The specified procedure makes it possible to reduce the cicatrization times of these ulcers and the time of the clinical manifestation of the disease compared with the same periods in the control group (V.V. Kerin et al, 1984).

Endoscopic use of an argon laser with a power of 8 W permitted Swain et al. (1981) to destroy a recurring tumor in the anastomosis in 1,000 seconds. After treatment of a patient previously operated on for stomach cancer, the patient began to receive liquid and crumbled food. The patency of the anastomosis was preserved.

Using lasers and special instruments makes it possible to improve the functional results of a stomach resection, and creating a single-layer pylorolike gastroenteroanastomosis improves the reserve function of the stump with the absence of accelerated evacuation and reflux of the intestinal contents (Ye.I. Preshov et al, 1982-1984).

Using laser radiation in endoscopy to stop stomach hemorrhage, etc., has necessitated development of a heat safety regimen.

Experimental studies [13] have established that the temperature of the serous membrane in the projection of the irradiation point may serve as the safety criterion when determining optimal total irradiation energy. Laser photocoagulation in the lumen of the gastrointestinal tract may be considered a safer method than diathermocoagulation in view of the range of safe exposures. Further studies on different models of acute hemorrhagic stomach ulcers with the use of laser radiation in different spectra of the effect have proved the effectiveness and reliability of laser photocoagulation [8-11]. Using auxiliary methods (a vasoconstrictor solution, removal of escaping blood by a gas or liquid stream) at the moment of coagulation increases the reliability and effectiveness percentages of argon laser radiation on the hemorrhagic section of the stomach's mucous membrane.

Clinical approbation of the endoscopic delivery of argon radiation to the organs for hemorrhage in the stomach and duodenum makes it possible to hope for the promise of the method [8-11]. Direct hemostasis was attained in all cases in 478 patients with gastrointestinal hemorrhage. Only in 12 patients operated on 4 and 12 hours after the initial hemostasis was a recurrence of hemorrhage observed from the bottom of the callous ulcers in the projection of the left gastric artery. An argon laser with a power of 3.5 to 6.0 W (duration of exposure, 11 to 80 seconds) was used in all cases.

An argon laser was used on 93 patients with gastroduodenal hemorrhage; on 14 of them, it was used as a result of hemorrhage after polypectomy of the loops (V.K. Skobelkin et al., 1983). One hundred twenty-nine laser coagulations were done. In a planned order after arresting the hemorrhage by photocoagulation, the authors operated on 14 patients with chronic ulcers and resectable stomach tumors. Ceasing the operation at the height of hemorrhage made it possible to reduce fatality in the postoperative period 3.2-fold compared with a group of patients who were treated without laser photocoagulation.

Morphological study of the change in the stomach's mucous membrane in an experiment after the effect of various spectra of laser radiation as a coagulant as soon as acute gastrointestinal hemorrhage began showed that the zone of injury from an argon laser was less [1, 2, 4]. No injury to the external target layer was detected in a single case. Epithelialization of the ulcerous defect over the connective tissue cicatrix formed in the bounds of the submucous layer

occurred 17 to 20 days from the moment of photocoagulation. In order to arrest gastrorrhagia, T. Polangi (1980) used a CO<sub>2</sub> laser for the first time. The team did not injure the layers located below. The author believes that the CO<sub>2</sub> laser may be indicated for direct laser coagulation of acute gastrorrhagias in the process of operating on an open stomach. The stomach's mucous membrane undergoes the same histological changes in the same time periods as during their spontaneous healing.

Analysis of the clinical results from exploratory biopsies on patients with acute gastrorrhagias after hemostasis through an endoscope showed that the process has a regular character with regeneration of the fundal glands and with subsequent differentiation of the accessory cells into parietal and main [1, 2, 4]. The development of aseptic productive inflammation with the absence of leukocyte infiltration subjected to coagulation necrosis must be considered a distinctive feature of the healing processes.

Authors indicate the promise of using the CO<sub>2</sub> laser in surgery on the gallbladder and bile ducts. O.K. Skobelkin (1983) and G.P. Shorokh (1983) et al. believe that the positive properties of a laser scalpel in conjunction with laser instruments and devices make it possible to operate on outpatients under conditions of lesser tissue traumatization, complete hemostasis, and the absence of bacterial iatrogenic contamination of the operable region.

Using a CO laser in lung resections is a new direction in thoracic surgery.

Experimental studies during lung resections (economical resections and pleuropulmonectomies) have indicated the absence of marked inflammatory changes in the tissues surrounding the wound on the line of the laser beam incision, i.e., the healing process is of the primary-adhesion type (V.G. Dobkin, 1984). Operations were performed on 74 patients with various lung diseases. In the process, the advantage of the laser scalpel was made clear: the operations progress with a lesser intraoperational hemorrhage, and the pleural cavity is protected against secondary infection and the alveolar infiltration of air by the coagulation film. Thus, the problem of preventing suppuration and treating postoperative wounds in patients with tuberculosis of the lungs has been solved. Radiation from a type LG-75 helium-neodymium laser with a wavelength of 0.63  $\mu\text{m}$  and a radiation power of 20 mW was used. Five to eight skin irradiation sessions were held before the operation, and their number was increased to 8 to 10 in the postoperative period (B.S. Demidov, 1984); the wounds healed by first intention in 18 patients, and total suppuration was observed in 1.

Rapid cleansing of purulent-necrotic tissues from the wound, earlier manifestation and growth of granulation tissue, and epithelialization of the wound were observed when a helium-neon laser was used on six patients in the complex treatment of purulent postoperative wounds. The open sanitation (B.S. Deimov et al, 1984) of different forms of empyema in patients with tuberculosis of the lungs by a CO<sub>2</sub> laser facilitates a reduction in surgical risk. The laser beam incision is sterile and not very traumatic, and the healing of "laser wounds" is of the primary-adhesion type. The sterilizing features of a defocused beam make it possible to effectively sanitize the empyema of the remaining cavities and decrease the time necessary to prepare patients for subsequent thoracomyoplastic operations 1.5-fold.

Using a laser scalpel (D.U. Umiraliyev, 1984) in phthisiosurgery significantly increases the effectiveness of lung resection in groups of critically ill patients.

In the opinion of this scholar, the formation of a coagulation film along the line of the incision prevents the penetration of infection into the underlying tissues and in addition has an effect of supplementarily reinforcing the mechanical suture. No specific complications were observed in those patients operated on with a laser. In only two (2.86 percent) patients was a residual pleural cavity observed that was liquidated by conservative methods in the postoperative period.

Experimental studies carried out on 60 rats for the purpose of studying the dynamics of wound healing and cicatrix formation when a CO<sub>2</sub> laser beam was used for various periods after the effect (D.A. Ismailov and I.M. Baybekov, 1984) indicate the occurrence of a coagulation necrosis zone. Changes of a destructive-inflammatory character that decreased in proportion to their distance from the site of the effect of the laser were noted in regions adjacent to this zone. Electron microscope examination established that "normalization" of the ultrastructure of the alveolar cells close to the necrosis zone is completed in 5 to 7 days after the effect of the laser. The formation of the connective tissue cicatrix was completed in this period. The changes in the ultrastructure of the epithelium are sustained longer than those of the alveolar cells.

Studies conducted on the parenchymal organs have indicated the promise of the laser beam.

Experiments on the pancreas of dogs produced more tender cicatrices than when an ordinary scalpel was used (Ye.I. Brekhov et al, 1982-1984). The use of special clamps intensified the hemostatic properties of the laser beam and made it possible to use the beam for the bloodless longitudinal incision of the pancreatic duct. The authors point to the complete and stable seal of the surface of the wound stump covered by the coagulation film.

Liver resections to treat tumors are better done with a CO<sub>2</sub> laser, which creates a good hemostatic effect and does not require a large number of supplementary ligatures (Maruyama et al, 1981). The YAG laser produces coagulation on the liver surface, whereas the CO<sub>2</sub> laser (Dory type) is free from this shortcoming. When a YAG laser was used for a liver resection in rabbits in an experiment and in six clinical patients, Yamao et al. (1981) noted the advantages of the laser scalpels: the hemostatic properties of the beam and fewer injuries to the liver tissue. Operations using a laser scalpel were performed quicker and with less hemorrhaging.

Thoroughly conducted experimental studies showed great hemostasis and the stoppage of the efflux of pancreatic fluid as a result of the formation of coagulation thrombi (Yu.G. Parkhomenko, G.D. Litvin et al, 1984). The inflammatory leukocyte reaction in the pancreas in response to laser trauma develops insignificantly. Exudate in the abdominal cavity in the postoperative period was not observed in any of the experiments conducted (in contrast to the control group).

Operation using the ordinary procedure is complicated during hemorrhagic pancreatitis and noninvasive tumors of the pancreas. Experimental studies on the use of the CO<sub>2</sub> laser and injecting Ringer's solution between the intestine and pancreas made it possible to simplify the technique of the operation and to obtain good short-term results (Di Donna, 1981). Experimental studies for the purpose of examining the effect of laser operations on the spleen on a coagulogram (G.D. Litvin, V.I. Korepanov, and A.P. Yakimenko, 1982) made it possible to conclude that the beams of CO<sub>2</sub> and YAG lasers do not cause changes in the coagulogram and clinical analysis of the blood and may be recommended for clinical use for hemostatic purposes during spleen operations. YAG lasers have a more marked hemostatic effect, stopping hemorrhage from the parenchyma of the liver and spleen five times faster than a CO<sub>2</sub> laser. Mature, fibrous connective tissue is formed at the site of the laser effect in time periods that are no different from those when traditional methods are used (P.I. Yeliseyenko, V.V. Petushkov, et al, 1982). The inflammation process occurs aseptically, without recurrent suppurations and hemorrhages.

Using a CO<sub>2</sub> laser and a UC-60 suturing device in clinical practice made it possible to perform a liver resection with minimal trauma. In all cases, the tantalum agraffes hermetically sutured the ducts and vessels of the organ (O.K. Skobelkin et al, 1982-1984). Parenchymatous hemorrhage stopped after treatment of the wound surface with the defocused beam of a CO<sub>2</sub> laser. Operations were performed on 10 patients with pancreas pathology; before the laser resection their large vessels were subjected to thorough treatment and ligation. Complication after the operation is prevented by a combination of laser dissection of the pancreas, which is compressed by a special clamp, and the application of medicinal adhesive onto the section of the gland (V.M. Buyarov et al, 1983). Laser-adhesive treatment of the stump of the pancreas facilitates its reliable closing and also prevents hemorrhage and efflux of secretion.

Principles of operations on the parenchymatous organs using laser devices and various instruments have recently been developed (G.D. Litvin et al, 1982). A laser beam, best with a YAG laser, seals the liver in order to completely arrest the hemorrhage and bile efflux to the parenchyma. In operations on the pancreas, special clamps were used that permitted its resection with a laser beam without destroying the parenchyma. In operations on the spleen, parenchymal hemorrhage is effectively stopped with the beam of a YAG laser.

The effectiveness of using a CO<sub>2</sub> laser in surgery on the pancreas is shown in the work of O.K. Skobelkin et al (1984). Stable hemostasis and the absence of the efflux of pancreatic fluid during the operation and in the postoperative period is noted in it. The laser beam "seals" both the large and small ducts of the gland as well as the enzyme-producing cells.

The effect of laser radiation on the cell culture of a human liver carcinoma (Fu-Shou et al, 1981) has yielded positive results. Irradiation by a nitrogen and argon laser increased the percentage of destruction of the cells injured by the cancer process.

Experimental use of the CO<sub>2</sub> laser in surgery on the bile ducts makes it possible to hope for the promise of the laser operating procedure.

Photocoagulation by a CO<sub>2</sub> laser makes it possible to arrest hemorrhage and bile efflux from the bed of the gallbladder; in the process, the wound heals in a shorter time and with a lesser inflammatory reaction than in wounds sutured with cat gut. It was revealed that the technique of the operation may be simplified on account of hemostasis. Aseptic inflammation without leukocyte infiltration as the anastomoses, formed by a laser, heal did not lead to cicatricial deformation of the anastomoses.

The use of a YAG laser under experimental and clinical conditions indicated the promise of its use: a laser scalpel made of quartz makes it possible to remove tissue with lesser energy expenditures and, consequently, with fewer injuries and has good hemostatic properties. The clinical use of a CO<sub>2</sub> laser on 27 patients with disease of the extrahepatic bile ducts using a special instrument simplified the operative intervention technique [8-11].

A special set of instruments makes it possible to perform laser operations on the large duodenal papillae and the retroduodenal section of the choledochus and common bile duct.

Clinical observations of patients operated on after removal of the gallbladder using a CO<sub>2</sub> laser showed a favorable course of the postoperative period (O.K. Skobelkin et al. 1982). In 79 percent of the cases, intestinal peristalsis was restored in the course of days, and the amount of drainage discharge from under the hepatic space was insignificant (on the average  $14.8 \pm 16.8$  cm<sup>3</sup>). In the control group, peristalsis was restored in the first few days in 25 percent of the patients, and the amount of drainage discharge was  $64.0 \pm 9.2$  cm<sup>3</sup>. As a result of using a CO<sub>2</sub> laser in surgery on the extrahepatic bile ducts (54 operations), the technique of the operations was simplified, and their traumatism was reduced. Surgical interventions using a CO<sub>2</sub> laser during complicated forms of cholecystitis not only eases the course of the postoperative period but also reduces the differences in the results of operations for chronic and acute cholecystitis (A.P. Yakimenko and G.D. Litvin, 1983). Endoscopic study of anastomoses with exploratory biopsy in 14 patients in a period from 14 days to 4 years showed a more rapid than usual abatement of the inflammation process in the anastomosis zone and the absence of anastomoses and cicatricial deformations in the long-term postoperative period. The destruction of bilirubin stones by the beam of a YAG laser through a choledochoscope is effective and does not require operative treatment (Oril et al. 1981). A choledochofibroscope was inserted into a trio of patients through a T-shaped drainage and through a fistula in another trio; a percutaneous, perhepatic catheterization of the bile ducts was achieved as a result. Experimental and clinical use of a YAG laser with a power of 20 W through a choledochoscope showed its destructive effect on cholesterol stones in the course of 10 seconds and bilirubin stones in 30 seconds (Hayakawa et al, 1981). The authors believe that it is more expedient to destroy stones in a physiological solution that protects the surrounding tissue from heating rather than in an air medium.

Using a laser in the treatment of osteomyelitis (M.A. Galejev, 1984 and our observations) made it possible to attain hemostasis and the sterility of the wound, prevent generalization of infection, and sustain the hydration and proliferation phase. This facilitated acceleration of the reparative processes of bone tissue and rapid healing of the wound. The nature of laser intervention in our 14 patients involved treating the wound cavity with a defocused

laser beam: a sequestrectomy and treatment of the cavity with a defocused laser beam in 2, a resection of half of the ossa metatarsalia and the effect of a defocused beam in 2, and dissection of the edges of the wound with a laser scalpel and treatment of the cavity with a defocused beam in 1. The laser treatment consisted of the following: First, the operations were performed under general or local anesthesia. After opening the purulent cavity, the wound was mechanically cleansed of purulent-necrotic masses. Then, the necrotic masses were vaporized with a focused laser beam, i.e., the necrotic masses and pus were transformed into aerosol and gaseous products that were removed from the operative field by a smoke-suctioning system. Testing for shifting of the laser beam was done visually based on the illumination of very small angle small particles formed at the moment of the tissues' vaporization. In one patient, vaporization was combined with dissection of the tissues. The wound surface was additionally treated with a defocused beam in order to sterilize it. The time spent on treating the wound fluctuated between 2 and 18 minutes. Sutures were applied after the wound was treated. The wound was drained depending on its dimensions and depth.

The specific interest of urologists in using a CO<sub>2</sub> laser to treat diseases of the bladder, prostate gland, and ureter, as well as adenomae of the prostate, unhealed suprapubic fistulae, bladder stones and tumors, polyps and papillae of the ureter, etc., should be noted (A.D. Nikolskiy et al, 1984). In certain operations (bladder tumors), the authors have completely abandoned double-layer cat gut sutures. Treating inflammatory bladder disease with a laser endoscope has turned out to be very promising (Z.S. Vaynberg et al, 1984). Without opening the bladder, a laser beam has been able to place a fiber cystoscope through an operative channel to the focus of an inflammation. Positive anti-inflammation therapy using an LG-79-1 laser in 12 patients who were previously treated unsuccessfully in hospitals makes it possible to hope for the birth of a new direction in treating certain urological diseases.

Using a helium-neon laser to treat head and muscle pains and neuralgias through stimulation of corresponding points has made it possible to conduct therapy effectively (Kamikawa et al, 1981). The duration of treatment was 2 minutes. Galderhead et al. (1981) noted the effectiveness of a YAG laser with deeply located points responsible for pain. Using an aluminum arsenide laser has made it possible to attain the complete disappearance of pain in 26 percent of the patients, and the rest noted an improvement. The effect of a gallium arsenide laser on acupuncture points for purposes of electrolaser reflex therapy has improved the functions (V.A. Eulin, V.J. Korepanov, 1983) of the abdominal organs after operations. The acupuncture point was irradiated for 20 to 30 seconds, and the entire procedure lasted 5 to 6 minutes. Laser reflex therapy was considered effective (destruction of paresis) when improvement came within the first few hours and satisfactory when it came the second day or after repeated exposure during subsequent days.

Treatment of deep burns and the possibilities of early laser necrectomy is still not developed at the present time. Experimental studies conducted on 124 rabbits have shown that the CO<sub>2</sub> laser has an indisputable advantage over the ordinary scalpel inasmuch as its use makes it possible to perform the operative intervention bloodlessly (V.V. Pilipikha and V.M. Chegin, 1982). The method of injecting a 0.25-percent solution of novocain as a photohydraulic preparation,

making a line of demarcation with a razor at one-half the thickness of the skin of the notching, and subsequently treating the burn surface with a CO<sub>2</sub> laser revealed the intactness of the skin during the effect of the laser beam on the wound and its edges. The preparation time for the autodermoplasty during laser necrectomy was reduced 1.5-fold. In 100 percent of the cases, the graft survived the tenth to twelfth day. The insignificant number of clinical observations of early laser radical necrectomy revealed a reduction in blood toxicity compared with those patients on whom a necrectomy was not performed (E.D. Komarov, 1983). The laser surgical installations used in the treatment were the Skalpel-I (CO<sub>2</sub>) and LGM-2 with a wavelength of 10.6  $\mu$ m. The same method of early laser necrectomy was used on nine patients regardless of the size of the burn (1 to 15 percent). After the application of a contoured incision on the border of the healthy and injured skin, parallel incisions made with laser radiation separated the burn crust into individual bands with a width of 4 to 6 cm each, and the large vessels were ligated. One-time autodermoplasty was undertaken after removal of the burn crust in a unit with subcutaneous fatty cellulose. However, Fidler (1981), who had treated children with third-degree burns (a burn surface of 80 to 90 percent), believed that the CO<sub>2</sub> laser is not significant for the survival of the autotransplantate and does not play a role in skin cosmetics. The burn crust on the body and extremities was dissected 2 to 23 days after the burn.

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EFFECTS OF LOW-ENERGY LASER BEAMS AND POLARIZED MONOCHROMATIC RED LIGHT ON STAPHYLOCOCCI

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 2, Feb 86 pp 45-47

[Article by V.V. Kalugin, Scientific Research Skin and Venereal Disease Institute, Alma-Ata]

[Abstract] An assessment was conducted on the effects of low-energy irradiation with an LG-85 helium-neon laser (632 nm, 2-4 mW/cm<sup>2</sup>) or with polarized monochromatic red light (630-650 nm, 0.2-10 mW/cm<sup>2</sup>) on the treatment of 14 patients with various skin conditions, and on the effects of such irradiation on antibiotic susceptibility of staphylococci. The patients ranged in age from 20 to 64 years, with skin lesions (trophic ulcers, eczema, pyodermatitis, acne) of 3 months to 16 years duration. Irradiation of the affected areas with either modality led to enhanced regeneration and abatement of inflammation after 1 to 10 min exposures for a total of 10 sessions. In addition, a total of 240 staphylococcal strains isolated from the patients were irradiated on solid media and tested for the effects on antibiotic susceptibility. The effects were variable, depending on the number of irradiations and intensity of the light beam. However, on an overall basis the staphylococci were rendered more susceptible to antibiotics by irradiation with either source. These observations suggest that the use of helium-neon lasers or polarized red light may be used for enhanced staphylococcal susceptibility to antibiotics in clinical situations, thereby rendering chemotherapy more effective. References 6 (Russian).

12172/9716

CSO: 1840/2106

## LASER ANGIOPLASTY: EFFECTS OF LASER ENERGY ON HUMAN CORONARY ARTERIES

Moscow KARDIOLOGIYA in Russian Vol 24, No 2, Feb 86 (manuscript received 18 Feb 85) pp 42-48

[Article by Yu.S. Petrosyan, N.N. Kipshidze, S.A. Putilin, L.D. Krymskiy, A.A. Mozhina, R.S. Shevelevich and A.N. Izotov, Cardiovascular Surgery Institute (ISSKh) imeni A.N. Bakulev, USSR Academy of Medical Sciences; "Stekloplastik" Scientific Production Association, Moscow]

[Abstract] Cadaveric material obtained from 5 cases within several days of death was used to assess the feasibility of laser-mediated resolution of atherosclerotic plaques and laser effects on coronary arteries. The coronary arteries were obtained from men and women ranging in age from 31 to 84 years. Unstained and Sudan IV-stained preparations were irradiated with an Ikar laser ( $\lambda = 1.06 \mu\text{m}$ ) with pulse frequencies of 1 to 10 Hz and pulse energies of 1.2 J, followed by histologic analyses of the effects. Similarly, 'wet' preparations were irradiated in either physiological saline or in hemolyzed human blood. For equivalent effects in coronary artery damage and plaque resolution or channel formation the exposure time and energies required were 4- to 6-fold greater in the wet situations, translating into respective values of 100 sec and 600 J. The data indicated that properly controlled laser can be used to produce 'clean' resolution of atherosclerotic plaques without detritus formation, although the nature of the 'volatile' products produced by the evaporation remains unclear. Experiments conducted in hemolyzed blood produced far less charring than seen in the other situations, again underscoring the potential for clinical application. Figures 4; references 16: 3 Russian, 13 Western.

12172/9716

CSO: 1840/2031

TREATMENT OF TROPHIC ULCERS AND SLOWLY-HEALING WOUNDS BY USE OF CO<sub>2</sub>-LASERS

Moscow KHIRURGIYA in Russian No 9, Sep 85 (manuscript received 12 Mar 84) pp 76-80

[Article by V.N. Koshelev, professor and Ye. I. Glukhov, Department of Elective Surgery (head-professor V.N. Koshelev) of the Therapy Faculty, Saratov Medical Institute]

[Abstract] Development of methods of combined use of CO<sub>2</sub>-lasers in treatment of ulcers and slowly-healing wounds and selection of optimum radiation intensity according to clinical and morphological signs of regeneration processes in wounds are described and discussed. Therapeutic tactics and selection of laser radiation parameters were chosen according to the nature of the wounds and ulcers and the state of regeneration processes, determined by biochemical and histological study of biopsy material from the bottom and edges of the wounds. Two methods were used: necrotomy by high-intensity laser radiation

from a Skalpel-1 device with subsequent treatment of the wound surface by a defocused beam and continuation of treatment by use of low-intensity radiation from a Klinika-2 laser and laser treatment of the wound surface by low-intensity radiation to heal anergic granulation and stimulate regeneration processes. Autodermoplasty was used on injuries >30 cm. Treatment of 200 persons (120 women and 80 men) ranging in age from 13-18 years with diseases persisting for 1-10 years showed the high effectiveness of the procedures used. Complete healing was achieved in 167 (83.6 percent) of the cases and partial healing occurred in 33 (16.4 percent) cases. Study of remote results (1-5 years) in 120 patients showed good results in 104 (86.6 percent) cases; 16 of 23 patients with partial healing underwent further laser therapy within 2-3 months and complete epithelization occurred in 12 of these cases. Best results of use of these procedures are gained by systematic monitoring of regeneration processes and timely modification of laser radiation parameters as required. References 10: 9 Russian, 1 Western.

2791/9716

CSO: 1840/2033

#### USE OF CARBON DIOXIDE LASER IN COMBINED THERAPY OF ECHINOCOCCOSIS

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 9, Sep 85 pp 69-70

[Article by S.O. Ordabekov, A.S. Ovsyannikov and K.A. Usenov, Surgical Department, Dzhambul Oblast Hospital]

[Abstract] Description is provided of the use of the carbon dioxide laser Skalpel-1 in the treatment of hepatic cases of echinococcosis. The 12 patients ranged in age from 25 to 67 years and were subjected to conventional surgical intervention. Following cyst removal the bed was treated with 3% iodine solution for 3 min, followed by inactivation of the iodine with 30% sodium thiosulfate. After drying, the cyst bed was subjected to laser irradiation (10.6  $\mu$ m, 30 W) using a defocused beam. The efficacy of introducing the laser component into the surgical regimen was substantiated by the absence of complications and the more favorable course of the patients which permitted discharge on an average of 14.6 days, versus 19.3 days for patients in whom the laser therapy was not employed.

12172/9716

CSO: 1840/2058

# RESULTS OF COMBINED TREATMENT OF SIALOADENITIS INCORPORATING HELIUM-NEON LASER

Leningrad VESTNIK KHIRURGII IMENI I.I. GREKOVA in Russian No 10, Oct 85  
(manuscript received 6 Jul 84) pp 39-42

[Article by A.G. Kats, I.M. Belostotskaya, Z.P. Malomud and L.G. Makarova,  
Chair of Propedeutic Surgical Stomatology, Moscow Medical Stomatological  
Institute imeni N.A. Semashko]

[Abstract] Clinical trials were conducted with the use of a low-energy helium-neon laser in the combined treatment of sialoadenitis in male and female patients ranging in age from 17 to 75 years. Conventional management of 47 patients resulted in 5 cures and clinical improvements in the remaining cases. The average length of remission in this group was  $1.2 \pm 0.9$  years. An additional 41 patients were subjected to a combination of conventional therapy supplemented with irradiation from a low-energy LTM-01 helium-neon laser. The output power of the defocused beam ranged from 0.5 to 1 mW with 2-10 min exposures, depending on the clinical course, with the total number of exposures per day and time period depending on the clinical manifestations. In the latter group 7 clinical cures were obtained, the laser therapy was without apparent effect in 4 cases, and clinical improvements were seen in the remaining patients. The average length of remission in the laser group was  $2.6 \pm 1.4$  years. Although the mechanism of action of the 630 nm light in alleviating chronic sialoadenitis is not understood, there is now clinical substantiation of its therapeutic efficacy in the treatment of this condition. Figures 1; references 3: 2 Russian, 1 Western.

12172/9716

CSO: 1840/2079

UDC 616-001.4-002.3-085.849.19-036.8-07

# THERAPY OF PURULENT WOUNDS WITH HELIUM-CADMIUM LASER

Moscow SOVETSKAYA MEDITSINA in Russian No 2, Feb 86 (manuscript received 11 Sep 84) pp 110-115

[Article by A.B. Shekhter, V.K. Gostishchev, A.V. Nikolayev, V.A. Vertyanov, V.V. Shchur, A.N. Novochenko, A.M. Shapiro and L.A. Mamedov, Central Scientific Research Laboratory imeni S.I. Chechulin, Chair of General Surgery, 1st Moscow Medical Institute imeni I.M. Sechenov]

[Abstract] Preliminary studies with the use of a helium-cadmium laser on experimental rats with skin wounds demonstrated accelerated healing and led to clinical application in the case of 60 patients with cutaneous, purulent lesions 3-20 days in duration. Prior to irradiation, the wounds were treated with 3% hydrogen peroxide and nitrofurazone and then subjected to irradiation from the LPM-11 helium-cadmium laser emitting at 441.6 nm with a power output of 20-30 mW. A single 4.5 J dose was administered over a

2-4 min period/day for 5-10 days. The data showed that the wounds cleared and healed earlier in patients treated with the helium-cadmium laser. Healing was obtained 2.7 days earlier than in patients treated with a helium-neon laser, and 8.7 days earlier than in patients treated with 10% sodium chloride and ointment dressing. Figures 4; references 12 (Russian).

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CSO: 1840/2113

UDC 616.71-001.5-089.84

SHAPE-MEMORY TiNi ALLOYS: USE IN TRAUMATOLOGY AND ORTHOPEDICS

Moscow ORTOPEDIYA, TRAVMATOLOGIYA I PROTEZIROVANIYE in Russian No 2, Feb 86  
(manuscript received 27 Jun 84) pp 1-6

[Article by I.A. Vityugov, V.V. Kotenko, V.E. Gyunter, V.K. Polenichkin, V.I. Itin and V.A. Kopysova, Chairs of Traumatology, Orthopedics and Military Field Surgery, and Chair of Stomatology, Novokuznetsk Institute for the Advanced Training of Physicians]

[Abstract] Corrosion and biocompatibility trials were conducted with shape-memory TiNi alloys incorporating Fe, Co, V, Cu, Si, N, O, C, Mo and/or Ag, to ascertain their putative usefulness in orthopedic surgery. Potentiodynamic studies in 5% v/v HNO<sub>3</sub>, 3.7% v/v HCl, 40% v/v KOH or 50% v/v HCOOH demonstrated that the highest corrosion resistance was shown by stoichiometric TiNi, with nonstoichiometric alloys showing at the most a 1.02-fold decrease in corrosion resistance, which was deemed insignificant from a clinical viewpoint. Subcutaneous implants of TN-1E alloy in rats for 2 to 360 days and histological monitoring indicated essential biocompatibility, with only a thin enclosing capsule evident after one year. There were no histological indications of any neoplastic potential of the TiNi alloy. These findings indicate that TiNi shape-memory alloys will find extensive use in orthopedics. References 38: 18 Russian, 20 Western.

12172/9716

CSO: 1840/2076

BLOOD OXYGENATOR

Leningrad VECHERNOY LENINGRAD in Russian 20 Jan 86 p 1

[Article by G. Izrantsev]

[Abstract] A novel oxygenator--an artificial lung--has been produced by the combined research efforts of the medical instruments collective at the Sever Textile-and-Clothing Association and the Plastpolimer Association. The apparatus utilizes a porous polyfluoroethylene (fluoroplast) membrane

that allows for the passage of oxygen and yet is impermeable to blood, and has undergone successful clinical trials in Moscow, Kiev, Leningrad and other cities. On the basis of the results of these trials, the USSR Ministry of Health has approved this oxygenator for mass production in 1987. Figure 1.

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#### PROGRESS IN ONCOLOGY

Tbilisi MOLODEZH GRUZII in Russian 20 Feb 86 p 2

[Abstract] A meeting of oncologists from the COMECON countries in Budapest led to the general conclusion that only close cooperation of the specialists from the various countries will bring to a successful conclusion the war on cancer. The meeting covered past scientific progress in oncology and noted the need for a more unified approach to many problems. Georgian oncologists have always been active participants in such conferences of the COMECON countries, and have shared freely of their experience. The conference concluded with general guidelines for future research, and the decision to hold the next meeting in Tbilisi in 1987.

12172/9716  
CSO: 1840/1147

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#### MANAGEMENT OF HEART WOUNDS AT RAYON HOSPITALS

Kiev KLINICHESKAYA KHIRURGIYA in Russian No 10, Oct 85 (manuscript received 13 Jul 84) p 50

[Article by N.N. Volobuyev, G.V. Deryugin, A.A. Glechik, S.M. Gutov, V.S. Klimenko, A.P. Sirosh, A.P. Ulyanov and R.F. Shkrebko, No 2 Chair of Surgical Diseases, Crimean Order of the Red Banner of Labor Medical Institute; Saki Central Rayon Hospital, Crimean Oblast]

[Abstract] Management of heart wounds can be carried out at central rayon hospitals, provided the surgeons and anesthesiologists have received specialized training in the recognition of such lesions and in their surgical treatment. At the Saki Central Rayon Hospital 6 such patients were surgically treated between 1979 and 1983, with 5 survivals and 1 fatality. The loss of the one patient was due to extensive endocardial damage affecting the conducting pathways and the mitral valve. Following surgery, the patients should be monitored for heart murmurs to ascertain whether they should be referred to a specialized center because of potential mitral involvement. References 3 (Russian).

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CSO: 1840/2081

## GASTROPLEUROBRONCHIAL FISTULA FOLLOWING THORACOABDOMINAL GUNSHOT WOUND

Kiev KLINICHESKAYA KHIRURGIYA in Russian No 10, Oct 85 (manuscript received 24 Dec 84) pp 53-54

[Article by V.D. Khodov and V. A. Kharitonov, Kiev]

[Abstract] The case of a 20-year-old male patient is presented who had sustained a thoracoabdominal gunshot wound. He was first seen on 19 Sep 83 with a path of damage that included injury to the left lung, the left part of the diaphragm, the stomach, and the urinary bladder. The stormy clinical course of the patient required several surgical interventions, one of them being for a gastropleurobronchial fistula. The course of the patient was further complicated by the onset of serum hepatitis with total serum bilirubin reaching 150  $\mu$ moles/liter. The patient was eventually discharged on 3 Feb 84 in a satisfactory state.

12172/9716

CSO: 1840/2081

UDC 615.451.35+615.451.35.015.2:615.844.6

## AEROSOL AND ELECTROAEROSOL THERAPY

Moscow MEDITSINSKAYA SESTRA in Russian No 12, Dec 85 pp 26-27

[Article by A.V. Gerasimov, candidate of medical sciences, Central Institute for the Advanced Training of Physicians, Moscow]

[Abstract] A brief review is provided of aerosols and electroaerosols, with the advantages that the latter offers in therapy. Electroaerosols, either with a (+) or a (-) charge, are obtained by the use of an induction apparatus that creates a constant electric field at the outlet of the aerosol generator. The advantages of electroaerosols include the fact that the preparations remain dispersed since all the particles have a like charge. Negatively charged electroaerosols have been shown to have much better clinical applications, in that they adhere better to the mucous membrane of the respiratory tract, increase ciliary action, improve respiratory function, increase bronchial permeability, improve drug delivery to the blood stream, and so forth. Electro-aerosol therapy is generally carried out at an aerosol temperature of 37-38°C, using 25-200 ml of a 2-3% solution to generate the aerosol. An added advantage is that such drug delivery avoids first-pass hepatic inactivation.

12172/9716

CSO: 1840/2069

## VHF AND UHF THERAPY

Moscow MEDITSINSKAYA SESTRA in Russian No 12, Dec 85 pp 28-29

[Article by A.V. Gerasimov, candidate of medical sciences, Central Institute for the Advanced Training of Physicians, Moscow]

[Abstract] A brief review is provided of the mechanism of action of VHF and UHF fields on the human body, with an indication of physiological effects and therapeutic scope. UHF exerts a physical (thermal) effect and is also transformed into chemical energy. The latter is responsible for chemical changes in protein molecules, increased rates of metabolic reactions, etc. The thermal effects are responsible for many therapeutic applications, including reduction of edema, enhanced local capillary circulation, improved phagocytic activity, more efficient tissue regeneration, changes in tissue permeability, and so forth. Many of these factors underlie the more systemic manifestations evident in greater functional efficiency of the nervous system. UHF therapy has generally found application in the treatment of inflammatory conditions and tissue damage through stimulation of regenerative mechanisms and enhancement of local circulation. The effects of UHF are generally less intense and more uniform through a tissue. Cases in which VHF and UHF are avoided include the presence of metallic foreign bodies and hyperthyroidism.

12172/9716

CSO: 1840/2069

## SAFETY MEASURES IN WORKING WITH XERORADIOGRAPHY APPARATUS

Moscow MEDITSINSKAYA SESTRA in Russian No 12, Dec 85 pp 44-49

[Article by G.P. Kochetova and A.Ye. Gusev, Moscow Scientific Research Roentgen-Radiological Institute, RSFSR Ministry of Health]

[Abstract] In 1984 new instructions went into effect in the USSR regulating the safe operation of xeroradiography equipment, both from the point of view of the medical technicians and the patient. The problem is important because there are presently some 2500 such machines in the USSR that are used to examine more than 1.5 million patients a year. A summary of the regulations and concerns are covered, ranging from the organization of the examining rooms to the voltage requirements and permissible concentrations of styrene, acetone and toluene in the air. It is anticipated that reliance on this diagnostic technology will gain in importance, especially with the advent of the Soviet mass screening program. In view of this, it is the responsibility of the radiologic technicians to be familiar with all aspects of the operation of xeroradiography equipment and the appropriate safety precautions. Figures 3.

12172/9716

CSO: 1840/2069

## PERIODIC DISEASE

Kiev VRACHEBNOYE DELO in Russian No 2, Feb 86 (manuscript received 4 Mar 85)  
pp 31-34

[Article by K. B. Fombershteyn, No 1 Health Resort polyclinic, Sochi]

[Abstract] Three members of a single family were treated for periodic disease [Reymann, 19 & 8] by physical therapy to test the efficacy of this therapeutic approach. Standard physical therapy was combined with climatological treatment supplemented by acureflexotherapy. The patients, representing three generations of the same family, sustained a remission period of 6-7.5 months after a course of therapy with subsequent recrudescence taking a much milder form. This is the first communication reporting on the success with a health resort approach to the management of periodic diseases, and also substantiated the hereditary nature of this type of disorder. References 8 (Russian).

12172/9716  
CSO: 1840/2111

UDC 616.988.41-036.2

## TRACHOMA CASES IN KABUL

Tashkent MEDITSINSKIY ZHURNAL UZBEKISTANA in Russian No 2, Feb 86 (manuscript received 11 Apr 85) pp 52-53

[Article by R.O. Mukhamadiyev, candidate of medical sciences, Denau Central Rayon Hospital]

[Abstract] With the transformation of Afghanistan from a feudal state to a country on its way to socialism, the incidence of trachoma in Kabul fell from 87% of all ophthalmological problems in 1964, to 21.8% of all eye disorders at the beginning of the eighties. With Soviet assistance, the Central Polyclinic in Kabul has placed all cases of trachoma under out-patient care with constant clinical monitoring and treatment, and health and hygiene education. In view of the fact that the various stages of trachoma may continue for years, measures have been taken to assure long-term care and assistance, with the populace showing an excellent compliance rate. The combination of early diagnosis, appropriate treatment and constant follow-up will assure the eventual liquidation of trachoma in Kabul. References 2 (Russian).

12172/9716  
CSO: 1840/2107

## ADVANCES IN MEDICAL LASERS

Tbilisi MOLODEZH GRUZII in Russian 7 Jan 86 p 1

[Article by Yu. Goldman]

[Abstract] The medical engineers at the Scientific Research Institute of Obstetrics and Gynecology imeni K.V. Chachava in Tbilisi were among the first to produce medically useful lasers. The application of lasers has spread widely, especially in Georgia, to a variety of medical specialties. The latter include cardiology and ophthalmology, for example, as well as physical therapy where lasers have been combined with acupuncture in the creation of a "laser puncture" technique. Such advances demonstrate in an unambiguous way the fruits of combining basic science with medical applications, and themselves serve as a stimulus to further cooperation between clinically and research-oriented investigators.

12172/9716

CSO: 1840/1160

UDC 576.851.49

DETECTION OF CHRONIC TYPHOID CARRIERS

Tashkent MEDITSINSKIY ZHURNAL UZBEKISTANA in Russian No 2, Feb 86 (manuscript received 22 May 85) pp 8-9

[Article by M.V. Nevskiy, M.Ya. Lerenman and Z.M. Aminzade, Scientific Research Institute of Epidemiology, Microbiology and Infectious Diseases, Uzbek SSR Ministry of Health]

[Abstract] A cohort of 33 chronic typhoid carriers were monitored for 18 months to define the conditions for identifying such individuals. The data showed that positive cultures were obtainable only on a sporadic basis, and then only in 7 of the subjects. For definitive carrier detection the suspect should be followed on an in-house basis with every stool and urine sample subjected to bacteriological study, and serum samples analyzed by passive hemagglutination for the presence of cysteine-resistant (7S) antibodies. References 2 (Russian).

12172/9716

CSO: 1840/2107

UDC 616-022.7:576.851.42:362.11

CHARACTERISTICS OF GRAM NEGATIVE BACTERIA ISOLATED FROM HOSPITALIZED PATIENTS AND HOSPITAL ENVIRONMENT

Baku AZERBAJDZHANSKIY MEDITSINSKIY ZHURNAL in Russian No 11, Nov 85 pp 68-71

[Article by B.G. Magerramov and L.E. Dadasheva, Chair of Microbiology, Azerbaijan Institute for the Advanced Training of Physicians imeni A. Aliyev, USSR Ministry of Health]

[Abstract] A bacteriologic study was conducted on the spread of Gram negative bacteria among patients, medical personnel and the environment in the pediatric, surgical and obstetrical wards of a large hospital. A total of 1932 isolates were analyzed, showing that Klebsiella accounted for 34.1% of the cultures, Enterobacter for 42.3%, Proteus for 10.2%, Citrobacter for 4.9%, Serratia for 3.6%, and Pseudomonas for 4.9%. In 28-30% of the cultures, the Gram negatives were associated with Staphylococcus aureus. These Gram

negative bacteria were found with equal frequency at all three wards, indicating their extensive presence throughout the hospital environment. References 12 (Russian).

12172/9716  
CSO: 1840/2065

UDC 613.2-099:637:52

#### BOTULISM DUE TO HOME-MADE CANNED STEWED MEAT

Kiev VRACHEBNOYE DELO in Russian No 1, Jan 86 (manuscript received 4 Jan 85)  
pp 114-115

[Article by D.N. Pinchuk and V.M. Filiptsov, Rovno Central City Hospital]

[Abstract] Four members of one family were hospitalized at the Central Hospital for botulism on 7/16/84, following ingestion of home-made canned stewed meat. The patients were initially seen at an outpatient ambulatory clinic where the correct diagnosis was not made, and hospitalized 5 days later. The clinical course in each case followed the classical pattern, with diagnosis based on the manifestations. Therapy was supportive with respiratory monitoring with all of the patients surviving. The last patient was discharged 37 days after admission with residual weakness and xeromastia.

12172/9716  
CSO: 1840/2066

UDC 576.8.095

#### EFFECTS OF RAPID TEMPERATURE SHIFTS ON TURBISTATIC YEAST CULTURES

Moscow BIOLOGICHESKIYE NAUKI in Russian No 10, Oct 85 (manuscript received 3 Oct 84) pp 88-92

[Article by V.A. Kalyuzhin, Scientific Research Institute of Biology and Biophysics, Tomsk State University imeni V.V. Kuybyshev]

[Abstract] A study was conducted on the effects of rapid up and down shifts of temperature on *Saccharomyces cerevisiae* turbistatic cultures to determine the physiological consequences of such environmental changes, since they simulate laboratory manipulations (e.g., refrigerator - room temperature - incubator, and vice versa). Temperature transition times were limited to 4 min, with subsequent incubation at the new temperature for 6-8 h. Shifts of  $14 \rightarrow 33^{\circ}\text{C}$ ,  $33 \rightarrow 39^{\circ}\text{C}$  and  $14 \rightarrow 39^{\circ}\text{C}$  were accompanied by an increase in cell volume and an immediate drop in the count of juvenile cells. With the exception of the  $14 \rightarrow 33^{\circ}\text{C}$  shift where the cell volume returned to previous baseline in ca. 4 h, in the other cases it remained at the higher plateau. The drop in juvenile cell fraction showed a reversal in ca. 2 h, followed by phasic fluctuations with a general downward trend to below baseline values. Shifts of  $33 \rightarrow 14^{\circ}\text{C}$ ,  $39 \rightarrow 33^{\circ}\text{C}$  and  $39 \rightarrow 14^{\circ}\text{C}$  showed no volume change in the first case and a gradual decline in the last two cases. In all three cases the fraction of juvenile cells showed a sharp increase, followed by phasic

oscillations with gradual reduction in the first case and a gradual increase in the last two shifts. These observations indicate that adaptive processes in *S. cerevisiae* persist for several generations. Figures 4; references 4 (Russian).

12172/9716

CSO: 1840/2100

UDC 591.553+(555)

#### ASSESSMENT OF SELF-REGULATORY FUNCTION OF ECOSYSTEMS

Moscow BIOLOGICHESKIYE NAUKI in Russian No 10, Oct 85 (manuscript received 27 Feb 84) pp 101-105

[Article by V.N. Maksimov, A.V. Lifshits and M.N. Korsak, Chair of General Ecology and Hydrobiology, Moscow State University imeni M.V. Lomonosov]

[Abstract] A new method has been proposed for the assessment of the self-regulatory function of ecosystems, based on the delineation of a minimal number of parameters that directly or indirectly affect primary productivity. This approach, designated as the full-factor experiment FFE 3<sup>2</sup>, was applied to the freshwater planktonic ecosystem in the Rybninsk Reservoir. The experiments consisted of an analysis of the effects of zinc and chromium on primary productivity of the phytoplankton. Nine variations utilizing different concentrations of zinc and chromium were employed with primary productivity related to 13 parameters (e.g., zinc concentration, bacterial productivity, algal biomass, saprophytic bacterial counts, etc.). The data showed that the self-regulatory ability of the ecosystem diminished markedly after 2-3 weeks, as indicated by the decrease in the number of factors on which primary production was dependent. Initially, primary productivity was found to depend on 11 factors; after 2-3 weeks only on 6 factors. It appears that the capacity of an ecosystem to sustain self-regulation--which determines the system's stability--is directly proportional to the number of parameters affecting primary productivity. References 6 (Russian).

12172/9716

CSO: 1840/2100

UDC 576.8.093:621.8

#### COMPARATIVE ANALYSIS OF MICROBIAL DNA LABELING METHODS

Moscow BIOLOGICHESKIYE NAUKI in Russian No 10, Oct 85 (manuscript received 11 Mar 85) pp 106-110

[Article by V.V. Svetlichkin, A.M. Lysenko, V.G. Ignashov and N.B. Petrov, All-Union Scientific Research Institute of Biological Instrumentation]

[Abstract] A comparative analysis was conducted on several methods of radio-labeling microbial DNA, both plasmid and chromosomal molecules, using *E. coli*, *B. subtilis*, RI drd 19 and pBR 322 DNA. DNA-DNA hybridization and thermal stability of the duplexes was used to monitor labeling efficiency. Comparison

of in vivo, nick-translation, and enzymatic methylation methods demonstrated that the in vivo radiolabeling approach yielded preparations with the lowest specific radioactivity, whereas that of the latter two methods was generally comparable and up to an order of magnitude greater (e.g.,  $10^4$  vs.  $10^5$  or  $10^6$  cpm/ $\mu$ g). An advantage of the enzymatic methylation method over the nick-translation approach was the greater stability of the hybrid duplexes, as well as the fact that the reagents used are less expensive. Figures 1; references 9: 6 Russian, 3 Western.

12172/9716

CSO: 1840/2100

UDC 617-001.4.-002.3:022.7-085.837.3-036.8:07:617-001.4-008.8/-07

CLINICAL EXPERIMENTAL STUDY OF ULTRASONIC CAVITATION EFFECT ON MICROORGANISMS

Moscow ORTOPEDIYA, TRAVMATOLOGIYA I PROTEZIROVANIYE in Russian No 8, Aug 85  
(manuscript received 23 Mar 84) pp 29-32

[Article by V.V. Chaplinskiy, A. Ya. Ukhov, Ya.Ye. Yatskevich, V.S. Petrus, V.M. German, G.V. Shvaydetskaya and I.P. Leshchuk-Rachkevich, Department of Traumatology, Orthopedics, and Military Field Surgery and of Microbiology, L'vov Medical Institute]

[Abstract] Ultrasonic cavitation treatment of infections has received wide application, but little is known about its effects on microorganisms. The present article reports on study of 249 trauma patients, including fresh hand and foot wounds and breaks of fingers and toes, as well as 51 patients with deep necrotic infections in various locations. Ultrasonic cavitation treatment was indicated by severe contamination of the wounds and the difficulty of thorough surgical cleaning. Various staph and E. coli microorganisms were among those discovered in the wounds. In the first series of experiments, patients were treated with ultrasound and antibiotics, boric acid, furacillin, and lincomycin, while in the second, ultrasonic cavitation was the basic treatment. Results showed that the duration of ultrasound treatment was in direct correlation to the reduction in infectious microorganisms, which fell from ca. 915 to 202 specimens; when antibiotics were combined with ultrasonic cavitation, the number of vital cells fell to 45. Thus ultrasonic cavitation in combination with antibiotics was shown to be highly effective in treating deep infections of the types described. References 14 (Russian).

12131/9716  
CSO: 1840/2032

SKULL AND BRAIN WOUNDS

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 5, May 85 pp 70-72

[Article by A.A. Dubitskiy, Neurosurgical Department, Medical Emergency Hospital, Tselinograd]

[Abstract] A cursory review is provided of nine cases of gunshot wounds to the head seen at the Medical Emergency [Skoraya Pomoshch] Hospital in Tselinograd between 1973 and 1982. The basic conclusions were that highly qualified medical assistance rendered prior to the hospitalization was the key factor in successful outcome. The cases under consideration involved, in addition to skull damage, brain lesions that required brain surgery. Four of the patients survived with neurological sequelae, including hemiparesis in two cases.

12172/9716

CSO: 1840/2053

UDC 621.391.1:519.2

COMBINATION APPROACH TO BIOLOGICAL SELF-ASSEMBLY PROBLEMS: LINEAR STRUCTURE

Moscow PROBLEMY PEREDACHI INFORMATSII in Russian Vol 21, No 4, Oct-Dec 85  
(manuscript received 4 Oct 83) pp 88-98

[Article by Ya.S. Smetanich and V.V. Kornilov]

[Abstract] The philosophical problem of self-assembly in biology is approached from a mathematical viewpoint, assuming that the assembly of subunits into a whole depends on complementarity of the subunits. In the present case, recourse is had to the formal approach advanced by Caspar and Klug [Cold Spring Harbor Symp. Quant. Biol., 27:1-32, 1962; Biophys. J., 32 (1): 103-138, 1980], showing that when a given biological structure is dissociated into its components, the latter can only reassemble into the original structure. These considerations were applied to a simple--in this case linear--situation involving assembly of the letters of an alphabet into whole words, with complementarity represented by the relationship of individual letters. Specific consideration is given to three combination problems with each yielding a unique class of words. References 10: 8 Russian, 2 Western.

12172/9716  
CSO: 1840/1136

COMPUTER-ASSISTED ANALYSIS OF DRUG STRUCTURE AND ACTIVITY

Riga CINA in Latvian 18 Aug 85 p 4

[Article by LATINFORM correspondent: "Examination by Computer"]

[Text] A chemical substance from which a drug to induce sleep was to be obtained, turned out to be also capable of reducing pain and suppressing bacteria development. It had not been necessary to employ preliminary trials in order to establish that: properties of the new compound were determined from its structural formula by a computer which is said to evaluate in several seconds the various biological activity manifestations. After testing its own conclusions, the machine also immediately indicated its prognosis probability level. The automatic examination system "Pazime", which functions in this manner, was created by and is used in the Latvian SSR Academy of Sciences Organic Synthesis Institute.

Information on 12,000 chemical structures, investigated in creating drugs and plant protection chemicals, has been entered in the memory of the electronic expert. In working with these extensive data, the computer finds analogs, makes comparisons and draws logical conclusions. It can be established, from that, in what manner one or more molecular fragments satisfy the intended purpose of the next preparation. The "Pazime" system becomes the scientist's sure assistant. It speeds up by five- or six-fold the selection of needed compounds for experimental research.

The Organic Synthesis Institute is one of the leading users of cybernetics and computer science for chemical research. At its disposal are numerous mini-computers and micro-processors, many of which are installed in laboratory equipment. At present the computer here simulates complex reactions, models drug interactions with an organism's cells, analyzes the behavior of research animals, and prepares texts and illustrations for scientific publications. In the twelfth Five-Year Plan the institute will acquire the ability, with the help of computer networks, to reach the information banks of many other science centers.

12908/9716  
CSO: 1808/002

## TOXICOLOGICO-HYGIENIC ASPECTS OF USING OZONE FOR FRUIT PRESERVATION

Kishinev IZVESTIYA AKADEMII NAUK MOLDAVSKOY SSR: SERIYA BIOLOGICHESKIKH I  
KHIMICHESKIKH NAUK in Russian No 6, Nov-Dec 85 (manuscript received 19 Jun 84)  
pp 58-62

[Article by N. I. Opopol and G.V. Kushnir]

[Abstract] Various approaches are used to reduce the effects of biochemical processes on fruit and vegetables in storage. The present article reports on study of ozone ( $O_3$ ), a highly effective oxidant with a long history of use as a bacteriostatic and bacteriocidic agent. The authors studied the effects of ozone on organoleptic and other biochemical aspects of fruits treated with ozone, as well as the metabolism of such fruit for warm-blooded animals. Organoleptic effects of "Vengerka" plums, "Izabella" grapes, Jonathan apples and Champion peaches, subjected to 50 and 100 mg/m<sup>2</sup> of  $O_3$  for one hour, were of some significance, as was the biochemical impact of  $O_3$  for Jonathan and Mantuan apples. Then chronic toxicological experiments were conducted using 6 groups of 10 male white rats. The test rats were fed apples treated with  $O_3$  for one hour at 110 mg/cm<sup>3</sup>. Results showed that while the number of lymphocytes in peripheral blood of the several groups, the rats fed treated apples for a full day (group II) had strikingly different quantities of "allo-rosette-forming" cells, lower functional activity of T-lymphocytes, and a lower index of blastic transformation stimulation, than in other groups. The intensity of organoleptic changes was found to be in direct correlation to the time between  $O_3$  treatment and use of the food. Long use of  $O_3$ -treated food caused changes in non-specific resistance of test animals. References 23: 17 Russian, 6 Western.

12131/9716

CSO: 1840/2018

## DERMATOLOGICAL PATHOLOGY IN GREENHOUSE FEMALE WORKERS UPON CONTACT WITH CORBOPHOS MALATHION

Moscow VESTNIK DERMATOLOGII I VENEROLOGII in Russian No 11, Nov 85 (manuscript received 29 Jan 85) pp 40-42

[Article by S.M. Fedorov, Department of Dermatology (head professor A.A. Kalamkaryan), Central Dermatology and Venerology Institute, USSR Ministry of Health; Dermatological Clinic (head professor B.A. Somov), Scientific Research Institute of Labor Hygiene and Occupational Diseases, USSR Academy of Medical Sciences, Moscow]

[Abstract] Features of skin pathology occurring after contact with Malathion were studied in female ~~greenhouse~~-workers engaged in treating cucumbers with a 50 percent concentrate of Malathion emulsion. The study included 62 women ranging in age from 18-52 years (most were in 20-27 year age group) engaged in this work for periods of 6 months up to 23 years. Concomitant somatic diseases were not found but 14.5 percent of the workers experienced itching and slight burning pain at points of contact with the pesticide within 1-3 hours after contact. Bright-rosey erythema arose within 4-5 hours and miliary papules appeared in 3 persons. Blepharoconjunctivitis occurred in 3 persons but no pathology of the eyeball or inner eye was noted. The eruptions regressed spontaneously in 1-2 days. The skin pathology was attributed to the nature of the work. The rapid regression was assumed to be due to the low cumulative capacity of Malathion. The high volatility of the preparation promotes the rise of skin pathology. Toxicity parameters and hazards of use of Malathion are discussed briefly. References 16: 12 Russian, 4 Western.

2791/9716

CSO: 1840/2045

## PHYSIOLOGY

UDC: 612.0:577.49:578.087.1

### STUDY OF DIURNAL RHYTHMS IN MAN BY SPECTRAL METHODS

Frunze IZVESTIYA AKADEMII NAUK KIRGIZSKOY SSR in Russian No 5, Nov-Dec 85  
(manuscript received 15 Nov 84) pp 30-33

[Article by A.A. Sorokin, Institute of Physiology and Experimental Pathology of High Altitudes, Kirgiz SSR Academy of Sciences]

[Abstract] An analysis is presented of the relationship between the intensities of circadian and ultradian components for a large number of diurnal rhythms of physiological functions measured for a single group of 13 practically healthy males 22 to 28 years old. Experimental materials were analyzed for 50 functions of the body, including 7 physiological functions, 28 blood serum components and 15 urine components. During the test period, the subjects were maintained under strictly standardized conditions, eating and sleeping at precisely regulated times and not being allowed to perform heavy physical work. The actual tests were performed in 1969; this work presents new data from recent statistical analyses of the raw test data produced earlier. Description of the diurnal rhythms by means of kosinor analysis and spectral analysis required considerations of ultradian as well as circadian components. Figure 1, references 4: 3 Russian, 1 Western.

6508/9716  
CSO: 1840/346

UDC 616.155.194.7-07:616.155.18-02:612.275.1

### FEATURES OF KINETICS OF ACIDIC ERYTHROGRAMS IN NORMAL SUBJECTS AND IN PATIENTS WITH HYPOPLASTIC ANEMIA AT HIGH ALTITUDES

Moscow SOVETSKAYA MEDITSINA in Russian No 12, Dec 85 (manuscript received 22 Apr 85) pp 81-83

[Article by M. M. Mirrakhimov, corresponding member, USSR Academy of Medical Sciences, A.R. Raimzhanov and O.I. Popova, Department of Internal Medicine, Kirghiz Medical Institute, Frunze]

[Abstract] Short visits to high altitudes can cause increased erythropoiesis and rejuvenation of red blood, as part of the adaptive process, in normal subjects. Test animals with experimental hypogenerative ailments have also

shown changes in acidic resistance at high altitudes. The present article reports on study of the kinetics of high-altitude acidic hemolysis in 20 patients suffering from hypoplastic anemia and 8 healthy control subjects. Adaptation was assessed at 3200 m above sea level for 10, 20 and 40 days of presence. Baseline erythrograms were compared to determine changes in erythrocytes, hemoglobin, and reticulocytes. Results indicated that high-altitude adaptation caused activation of erythropoiesis in both healthy and anemic subjects. The number of erythrocytes of low resistance fell, while those of high resistance increased, although the overall values did not attain original levels even by the 40th day. Numbers of reticulocytes also increased. Figure 1; references 12: 9 Russian, 3 Western.

12131/9716  
CSO: 1840/2019

UDC 616-001.12-036.11-07:616.12-073.97

#### EKG PATTERNS IN ACUTE MOUNTAIN SICKNESS

Moscow KARDIOLOGIYA in Russian Vol 24, No 2, Feb 86 (manuscript received 20 Jan 85) pp 32-34

[Article by M.M. Mirrakhimov, R.O. Khamzamulin and O.N. Ragozin, Kirghiz Scientific Research Institute of Cardiology, Frunze]

[Abstract] An evaluation was conducted on the EKG patterns of 128 males, 18-20 years old, as a factor in the assessment of adaptability to high altitudes (3600 m, Murgab, the Pamirs). The individuals were divided in a group of 58 subjects that were free of mountain sickness after a month's stay at 3600 m above sea level (Group I), and a cohort of 70 subjects that developed mountain sickness (Group II). Comparison with baseline EKG patterns obtained at 1650 m showed that both groups presented with right heart overload as a result of hypertension at the high altitude. However, the manifestations of the overload were much more pronounced in Group II individuals, indicating both right atrial and right ventricular hypertrophy, tachycardia, and a shift to the right of the electrical axis in 28.5% of Group II individuals (vs. 5.1% in Group I subjects). Since, according to the Minnesota Code, evidence of right heart hypertrophy was evident in the control EKG patterns of the Group II subjects, it appears that such changes on the EKG may serve as predictive indicators of susceptibility to mountain sickness. References 14: 12 Russian, 2 Western.

12172/9716  
CSO: 1840/2031

UDC 618.39-089.888.14-084+613.888

MEASURES TO DECREASE ABORTIONS

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 1, Jan 86 pp 36-37

[Article by Ye. M. Savina, V.V. Terekhin, S.B. Odintsov, Social Hygiene Department No. 1 (headed by Prof. O. Ye. Chernetskiy), Rostov Medical Institute; Shakty Cotton-Combine Medical-Sanitary Unit--Medsanchast]

[Text] Organizing and performing annual preventive medical examinations of the entire population [dispensarization] require that the unique features of the examined population segments be considered. This primarily pertains to women, who constitute a major part of our country's total work force. In certain sectors of the national economy working women exceed two-thirds of the total number of workers. Therefore, preventive health care at enterprises or in institutions where the majority of workers are women has its own unique features. First, one must consider that, after respiratory illnesses, gynecological ailments are the second most frequent cause of illness resulting in lost working capacity. The gynecological sick rate is greatly governed by post-abortion complications which develop directly or indirectly after the operation. So far, organizational problems of reducing the number of unplanned pregnancies and, consequently, abortions, have not been solved effectively enough.

Our work indicates that the existing level of abortions can be reduced more than two-fold by adherence to organizational measures carried out in the preventive medical program.

Therefore, the first results of a three-year study on reducing the number of abortions at a large light industry enterprise, the Shakty Cotton Combine (SCC) in Rostov Oblast, are of interest. On the initiative of the medical staff, and with the active support of the combine's administration, a section on preventing abortions and reducing the gynecological sick rate was incorporated into the plan for performing the annual medical examinations. A procedure was established according to which all women newly hired at SCC are examined by gynecologists. They discuss the necessity of contraception, and a contraceptive device is recommended depending on the woman's health. The procedure for obtaining contraceptive devices is explained, and the woman is given appropriate instructions. A specific obstetrician-gynecologist is responsible for the

contraceptive work, as per order of the chief physician of the Medsanchast (MNSh). Office hours for contraception advice are organized on a sliding schedule in the PHS women's clinic and at all MNSh's. A system is set up to provide women with free contraceptive devices in the women's clinic, at each MNSh, and in women's hygiene rooms. Women can freely obtain the required number of mechanical and chemical contraceptives at women's hygiene rooms, and no record is kept. The room attendant obtains these devices at the health point. Depending on the woman's health, a preparation is chosen for a specific period, from 1 to 3 months. The feldsher (doctor's assistant) at the health point gives the women the assigned preparation free of charge and records the transaction in the hormonal contraceptive log. If indicated, intrauterine contraceptive devices (IUDs) are recommended. IUDs are implanted at every health point and in the women's consultation office. Implantation of IUDs is recorded in accordance with instructions for their use. The kind of contraceptive a woman is using is marked on the card of her dispensarization examination.

The number of contraceptive devices and the breakdown of their use were first compiled spontaneously. Now we can speak of the total structure and level of use in terms of indications and counterindications to use of particular devices: IUDs have been implanted into 16% of the women; 13% use hormonal contraceptives; 24%, mechanical devices; and 18%, rhythm method. Thus, experiments defined norms for demand for contraceptives, given that they are readily available and that demand is completely satisfied within the environment of an organized industrial enterprise collective. It is assumed that in the future maximum use of IUDs will be achieved, which will somewhat alter the structure of consumption.

The efficacy of this effort is demonstrated by the fact that in one year, the number of abortions at the enterprise dropped by 40.4 percent. How did the reduction in the number of abortions affect the sick rate? It remained about the same for all years, amounting to 7.7 percent of the sick rate related to lost working capacity; in the third year of the experiment, this rate did not decline. In the future one might expect a reduction in gynecological morbidity due to these efforts, since abortions performed in previous years are still having an effect.

The combine spends 324 rubles per year per 1,000 women of childbearing age for contraceptive devices.

The enterprise administration's interest in this work rose substantially when the savings realized by reducing abortions were calculated. Calculations showed that 150,000 rubles were saved by reducing the number of abortions.

At this stage in the effort, we may conclude that reducing the number of abortions and gynecological morbidity at a large enterprise is a controllable process and is possible only with the administration's active support.

The success of this effort was ensured by extensive explanation of the goals and problems of contraception to the women, given complete supply of contraceptive devices and efficient work by the entire medical staff of the Medsanchast.

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#### AUTOGENIC TRAINING IN TREATMENT OF WORLD WAR II INVALIDS

Kiev VRACHEBNOYE DELO in Russian No 1, Jan 86 (manuscript received 26 Mar 85)  
pp 99-100

[Article by L.A. Nagornyy and V.L. Shmulevich, Oblast Hospital for World War II Invalids, Kirovograd]

[Abstract] Autogenic training was employed in the management of WWII invalids at the Kirovograd Oblast Hospital for WWII Invalids, particularly in premorbid states indicative of personality dysfunctions or psychosomatic problems. The preparatory sessions were conducted with invalids possessing an average intelligence or better, limiting the sessions to two 10-15 periods per day. The actual periods of autogenic therapy were 40 min in duration. Over the past two years some 200 veterans had successfully undergone the course of autogenic therapy with the results that the patients gained a feeling of well-being, demonstrated attitudinal improvement, and experienced alleviation of sleeping disorders.

12172/9716  
CSO: 1840/2066

UDC 615.285:613.6

#### HYGIENIC STANDARDS FOR USE OF PROPELLANTS IN AEROSOL CANS

Kiev VRACHEBNOYE DELO in Russian No 1, Jan 86 (manuscript received 25 Mar 85)  
pp 106-108

[Article by D.S. Slobodskoy, Laboratory of New Domestic Chemicals, Kiev Scientific Research Institute of General and Communal Hygiene imeni A.N. Marzeyev]

[Abstract] The need to replace halogenated hydrocarbons in aerosol cans led to testing of various hydrocarbon gases, such as propane and butane, for their suitability as propellants. In order to further define their safety in such use, standard toxicological studies were conducted to define their spectrum of safety. Immunological studies on guinea pigs demonstrated that, in concentrations of 4 and 8 g/cm<sup>3</sup> air, propane and butane were nonallergenic and did not affect cellular differentiation in blast transformation tests, or

antibody formation. Studies with the bacterial Ames system indicated that they were nonmutagenic. In addition, propane, butane and isobutane were non-toxic when tested on human skin in air concentrations of 67.5 and 135 g/cm<sup>3</sup>. These findings indicate that the gases in question meet the safety requirements for use as propellants in domestic aerosol cans. References 5 (Russian).

12172/9716  
CSO: 1840/2066

UDC 616.9-084:362.121

#### DIAGNOSIS OF INFECTIOUS DISEASES IN POLYCLINIC SETTING

Kiev VRACHEBNOYE DELO in Russian No 1, Jan 86 (manuscript received 30 Oct 85)  
pp 118-120

[Article by A.F. Podlevskiy and N.M. Petrov, Chair of Infectious Diseases, Leningrad Sanitary Hygienic Institute]

[Abstract] A discussion is presented of some of the factors leading to diagnostic failure in the case of infectious diseases at local polyclinics and, hence, delayed recommendations for hospitalization. Overwork of the district physician is one of the important factors, while another is unfamiliarity with the myriad of clinical manifestations that an infection may assume. In view of epidemiologic consequences of misdiagnosis or delayed diagnosis in the case of some diseases, additional post-graduate training of the district physicians was shown to be an effective measure in improving diagnostic accuracy. First-hand knowledge of the various diagnostic parameters and a high index of suspicion are the key criteria to further improvements in the Soviet health delivery system.

12172/9716  
CSO: 1840/2066

#### MANAGEMENT OF PHARMACEUTICAL DRUG SUPPLY IN RURAL AREAS

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 9, Sep 85 pp 3-5

[Article by N.G. Tatimova and V.G. Pereverzev, Main Pharmaceutical Administration, Kazakh SSR Ministry of Health]

[Abstract] Concern for the health care of the rural populations in Kazakhstan has resulted in extensive expansion of the pharmacy network and in the variety of drugs that are available. Some 202 new central rayon pharmacies have been opened in such areas that provide support for another 1143 local pharmacies. The increase in the number of rural pharmacies equipped with drugs, other medications, instruments of the trade, and staffed by well-qualified pharmacists and other attendants, points to the progress made in recent years in rural health delivery in Kazakhstan. In addition, the Main Pharmaceutical Administration has made provisions for special courses and seminars to be held for the rural pharmacies as part of an on-going education

effort to assure the highest quality of service. All of these measures have served to narrow or, in some cases, to eliminate the gap in the quality of pharmaceutical service offered in the urban and rural areas.

12172/9716

CSO: 1840/2058

UDC 577.12:612.39.615.9:613.6

#### DIET COMPOSITION AND ITS EFFECTS ON NITROGEN METABOLISM IN PHOSPHORUS INDUSTRY WORKERS

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 9, Sep 85 pp 5-8

[Article by A.A. Mamyrbayev, T.D. Bimenbetov, M.Ye. Zholamanov and Ye.Zh. Aubakirov, Kazakh Branch, Institute of Nutrition, USSR Academy of Medical Sciences, Alma Ata]

[Abstract] The effects of diet composition on nitrogen metabolism in workers at the Chimkent "Fosfor" Industrial Association were studied to define an optimal diet for workers engaged in the production of phosphorus and its products. Based on previous nutritional experience and its metabolic consequences, a diet for this class of workers was designed to contain 52 g protein (26 g animal protein), 41 g fat (15 g plant fats), and 206 g carbohydrates for a total calorie value of 1342 Calories. Incorporated into the diet on a daily basis were 382 mg Ca, 242 mg Mg, 791 mg P, and 10.6 mg Fe, as well as the vitamins A (0.09 mg), B<sub>1</sub> (0.82 mg), B<sub>2</sub> (0.75 mg), PP (9.3 mg) and C (87.0 mg). Additional dietary supplements consisted of 100 mg of vitamin C and 2 mg of vitamin B<sub>1</sub>. The effects of this dietary regimen became apparent when the serum levels of residual nitrogen fell from 35.7 to 34.3 mg%, urea nitrogen from 17.6 to 15.95 mg%, and amine nitrogen from 6.63 to 5.84 mg% in the workers on the special diet. A similar normalization was evident in the nitrogenous components of urine. The diet in question, therefore, has been shown to be effective in mitigating the toxic effects of phosphorus in workers at risk of occupational exposure to phosphorus. References 4 (Russian).

12172/9716

CSO: 1840/2058

#### SOCIOECONOMIC EFFECTIVENESS OF GENERAL MASS MEDICAL SCREENING

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 9, Sep 85 pp 17-20

[Article by D.Z. Borokhov, T.K. Kalzhekov and O.T. Turekhanov, Scientific Research Institute of Regional Pathology, Alma-Ata]

[Abstract] An attempt was made at deriving a socioeconomic cost effectiveness figure for mass medical screening [dispensarization]. The particular data under analysis dealt with the city of Kentau, beginning with 1977. Efficient administrative measures permitted 90% of the population of some 53,000 to undergo mass screening, with the morbidity figures correlated with pro-

ductivity, work time and other vital statistics. The analysis demonstrated that the cost effectiveness of mass screening was on the order of 2.7 million rubles per year, of which 80% represents an increase in productivity and 10% the savings in medical costs due to early diagnosis and prevention of later medical problems. References 3 (Russian).

12172/9716

CSO: 1840/2058

#### ALCOHOLIC PSYCHOSES

Moscow ZDOROVYE in Russian No 12, Dec 85 pp 22-23

[Article by I.G. Urakov, doctor of medical sciences]

[Abstract] A brief description is provided of alcoholic psychoses, showing the progression from initial and barely perceptible stages to frank brain damage. All of the characteristic features are mentioned, including restlessness, insomnia, hallucinations, depression and delirium tremens terminating in Korsakoff's syndrome. A warning is issued, in conclusion, that alcoholics are potentially dangerous and that any signs of psychosis should be taken seriously and professional help sought by friends and relatives without delay.

12172/9716

CSO: 1840/2075

UDC 615.854.2:613.6

#### ADMINISTRATIVE APPROACH TO DIET THERAPY AT INDUSTRIAL ENTERPRISES

Kiev VRACHEBNOYE DELO in Russian No 2, Feb 86 (manuscript received 5 Jun 85) pp 108-111

[Article by N.V. Vankhanen, Ye.T. Dorokhova and A.A. Kovalenko, Chairs of Nutrition Hygiene and of Elective Therapy, 2nd Donetsk Medical Institute]

[Abstract] An analysis was conducted of 13,458 cases of temporary disability of workers at industrial enterprises in order to determine the most rational means of utilizing diet therapy in facilitating recovery. Taking into consideration the personality of the worker, his social environment and medical indications resulted in the identification of three categories of workers requiring special diets. Group I consisted of workers in the final stages of convalescence after an acute disease or with a chronic disorder but in stable remission, requiring diet therapy for 3-4 months. Group II consists of workers with frequent and prolonged episodes of a chronic condition who require special dietary therapy for 6-9 months per year. Finally, Group III was identified to encompass individuals with chronic conditions that show little abatement and require diet therapy for 9-12 months. With improvement in the clinical status, an individual may be reassigned from one group to another, e.g., from Group II to Group I. The specific therapeutic diets must be designed to enhance physiological wellbeing and correct underlying malnutrition, and accelerate excretion of toxic metabolites. References 6 (Russian).

12172/9716

CSO: 1840/2111

## SANITARY EDUCATION IN CONJUNCTION WITH INTENSIVE MASS SCREENING

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 5, May 85 pp 29-30

[Article by R.R. Denykh and S.I. Ibrayev, Kokchetav Oblast House of Sanitary Education; Zerendinskiy Central Rayon Hospital]

[Abstract] Serendinskiy Rayon was the first selected to undergo mass screening [dispensarization] in Kazakhstan, and as such the medical workers were faced with the problem of setting an efficient organizational pattern for carrying out this health program. From the beginning, major importance was placed on health education of the rural population in this agricultural rayon. The physicians and other medical personnel also received preparatory training, and all the health service facilities were equipped with the necessary instrumentation. As a result of the careful preparations, 90% of the population had undergone screening by October of 1985; the figure for machine operators and stock breeders was on the order of 98%. These figures indicate that the medical workers of the Zerendinskiy Rayon have taken their responsibilities seriously.

12172/9716  
CSO: 1840/2053

UDC 362.147:616-002.5-084,3-058.9:353.1(574)

## MOBILE TEAM APPROACH TO MASS HEALTH SCREENING IN CATTLE BREEDING RAYONS

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 3, Mar 86 pp 19-21

[Article by Z.T. Ryspekov, G.A. Munaytabasov, K.I. Baktybayeva, A.A. Amitakhunov and M.N. Nurzhauov, Kazakh Scientific Research Institute of Tuberculosis, Alma Ata]

[Abstract] The special cattle breeding conditions in the Tarbagatay and Uygur Rayons of Kazakhstan required special mobile teams to carry out the mass screening program [dispensarization] in order to cover the 1-2 family teams that herd the cattle from one grazing area to another. The present report covers the use of fluorography in monitoring the population for the incidence of tuberculosis, in conjunction with tuberculin testing and bacteriologic studies. The findings are broken down on the basis of sex, age, and organ involvement, demonstrating that, in these two rayons, tuberculosis is still a significant risk factor. The relatively high incidence of the disease suggests that previous screening campaigns were quite inadequate. In the Tarbagatay Rayon 2.4% of the children were tuberculin positive, and in Uygur Rayon 4.1% of the children gave a positive skin test. These observations indicate that mobile teams are a prerequisite for conducting adequate health monitoring programs in rayons with mobile preparations. References 5 (Russian).

12172/9716  
CSO: 1840/2086

## ROLE OF KAZAKH ONCOLOGICAL INSTITUTIONS IN GENERAL MASS MEDICAL SCREENING

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 12, Dec 85 pp 10-12

[Article by O.K. Kabiyeu, M.K. Kayrakbayev and B.Ye. Abdrakhimov, Kazakh Scientific Research Institute of Oncology and Radiology, Alma Ata]

[Abstract] One of the more important roles of oncological institutions in Kazakhstan is to provide guidelines for the diagnosis of precancerous or cancerous conditions by the uchastok and other physicians engaged in mass screening [dispensarization]. Indications are provided for the identification of risk groups for further referral to oncologists, whether based on on-site examination and laboratory studies or on the basis of information provided in patient questionnaires. The urgency of the situation became clear in 1984 when mass screening in the Kazakh SSR revealed a cancer morbidity incidence of only 0.051%, whereas the actual registration for the year showed an incidence of 13.4%. With the guidelines in hand, it is hoped that the physicians responsible for mass screening will function more efficiently in the detection of oncologic cases. References 2 (Russian).

12172/9716

CSO: 1840/2077

UDC 614.31.4"40"(476.6)

## ORGANIZATIONAL AND PROCEDURAL CENTER OF SANITATION SERVICE IN GRODNO OBLAST

Minsk ZDRAVOOKHRANENIYE BELORUSSII in Russian No 1, Jan-Feb 86 (manuscript received 7 Aug 85) pp 16-17

[Article by V.V. Vasilyev and F.I. Ignatovich, Grodno Oblast Sanitary-Epidemiological Station--Chief Medical Officer--V.V. Vasilyev]

[Abstract] The state system of sanitation and anti-epidemic service was organized in 1939 and included the Belostok and Baranovich oblasts. Under the German occupation everything was destroyed. Late in 1944 the service was resumed in all 15 regions, albeit with inadequate support, until the sanitary-epidemiological station was organized. The staff consisted of a chief epidemiologist and two assistants. During 1947-48 the station was transferred to a monastery building, where in 1949 hygienic and bacteriological laboratories were organized. In 1950 the staff numbered 45 individuals including 10 at the doctoral level. The staff and the facilities kept improving during the 60's and 70's; virological, toxicological, analytical and antipollution laboratories were set up. In 1972 a new building with a 2,700 m<sup>2</sup> area was constructed. Presently the staff consists of 232 individuals with 46 of them having advanced degrees. Many of these workers have earned recognition and respective medals. Figure 1 (photo of Sanepid Station).

7813/9716

CSO: 1840/2001

EXPERIENCE IN ORGANIZATION OF X-RAY-FLUOROGRAPHIC EXAMINATIONS IN SPARSELY POPULATED REGIONS

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 7, Jul 85 pp 12-14

[Article by Z.T. Ryspekov, G.A. Munaytbasova, R.I. Budnevich, A. Zh. Mazhitova and T.B. Baitov, Kazakh Scientific Research Institute of Tuberculosis, Mangyshlak Oblast Health Department]

[Abstract] Population density of Mangyshlak Oblast is one tenth that of other areas in USSR because it is a desert country in which small clusters of workers live around oil fields and grazing grounds of migrant cattle breeders. In order to service such a territory effectively, a centralized organization is advocated with mobile equipment visiting individual working sites. A file of each individual examined should be maintained to prevent double exposure while assuring follow up examination where needed. A special problem was noted in case of the shepherds: during summer months they just could not be reached. Therefore, careful scheduling for annual examinations must be prepared.

7813/9716  
CSO: 1840/2055

IMPROVEMENT IN OBSTETRICAL-GYNECOLOGIC SERVICE TO RURAL POPULATION

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 7, Jul 85 pp 11-12

[Article by B. A. Akhmetov and I. I. Berlyant, Ural Oblast Section of Public Health]

[Abstract] In the past years, the obstetrical service in central rayon hospitals was enlarged reaching 25-35 beds. The number of beds in small hospitals and feldsher-midwife stations has been steadily decreasing, the stress being laid on centralized service which increased from 57% to 80%. Special attention is given to beds for complicated pregnancies which now represent 37% of all beds; the occupancy rate is 352 days per year. The staff is given opportunities to continue their education by seminars and courses. A centralized file of all pregnancies is maintained, helping to monitor each case individually. Improvements in this service lowered perinatal mortality three-fold during the past five years.

7813/9716  
CSO: 1840/2055

## PHYSICIAN AMONG ENGINEERS

Minsk NARODNOYE KHOZYAYSTVO BELORUSSII in Russian No 2, Feb 86 p 44

[Article by unknown author; incomplete article]

[Abstract] A. Yemelyanov, chief of the Polyclinic Division at Minsk Clock Plant inquired about the role of physician-engineer brigades organized at many large factories; specifically, what is expected of the physicians. Answering this request, this article explains that many retired individuals (either incapacitated or pensioned) desire to return to work at least on a part time basis. The physician-engineer brigades should review all jobs according to standard criteria and evaluate each situation on a case by case basis. Also, they should be involved in preventive programs aimed at lowering debilitating accidents. Six job categories were indicated: 1- optimal work conditions for physical or mental performance; 2- conditions acceptable by labor, safety and physiological standards; 3- one or two factors may occasionally be substandard; 4- many factors are substandard for prolonged periods; 5- heavy physical labor; 6- labor under conditions detrimental to health. The first two categories could be acceptable to invalids and retirees, the third on individual, case by case basis. In no case should an assignment be considered which normally would exclude women and teenagers.

7813/9716

CSO: 1840/1138

## OUTPATIENT PEDIATRIC SURGERY

Dushanbe KOMMUNIST TADZHIKISTANA in Russian 10 Apr 86 p 4

[Article by O. Sobolev, correspondent, Tajik TA [Telegraph Agency]]

[Abstract] An outpatient pediatric surgery service has been put into operation at the No 3 RKB [republic clinical hospital] in Dushanbe, that permits surgery during a one-day visit and recuperation at home. The types of surgical procedures needed by the children are of a routine and minor nature, of course, and the parents receive careful instructions on how to take care of the small patients at home. However, the fact that some 1200 outpatient operations are now performed on a yearly basis indicates that more hospital beds and services are available to the more seriously ill.

12172/9716

CSO: 1840/1148

## MEDICAL ETHICS

Vilnius SOVETSKAYA LITVA in Russian 5 Apr 86 p 2

[Article by Yonas Yonovich Platukis, Minister of Health, Lithuanian SSR, based on interview by Aleksander Gelbakh]

[Abstract] One aspect of medical ethics is expressed in the saying that "The Patient is Always Right!" This expression basically means that a patient is given the full measure of doubt in any situation by the involved physician and other medical personnel, since they take into consideration the emotional status of those dependent on others for medical assistance. In some cases, however, physicians have to make decisions and take action that may appear contrary to the best interests of a patient or his relatives or friends. It is, in fact, in the latter context that difficulties arise in the physician-patient relationship and lead to charges of insensitivity or misconduct on the part of the physician or nurse. It is in the latter situation that full sensitivity and understanding must be displayed by the medical personnel, no matter what the provocation. However, no matter how the patient may take the physician's decision, the latter is obligated to proceed in full accordance with the best in medical practice based on his clinical experience.

12172/9716

CSO: 1840/1163

## SHORTAGE OF NURSES

Moscow VECHERNYAYA MOSKVA in Russian 24 Mar 86 p 2

[Article by S. Kotelnikova, senior nurse, and E. Yakubov, chief physician, No 36 Clinical Hospital, and S. Tabasheva, chief, Administration of Cadres and Intermediate Medical Educational Institutions, Main Health Administration, Moscow City Executive Committee]

[Abstract] The critical shortage of nurses is largely attributed to the nature of the intellectually and physically demanding work, low pay and prestige, and poor working conditions. In addition, the problem is further complicated by inadequate educational preparation and motivation. As a result, many nurses leave the hospital environment because of the stress and the lack of opportunities, and seek employment in other situations. In Moscow, the problem also lies in the fact that many rayons are without educational training facilities for boys and girls interested in nursing or other medical professions, while enrollments at existing institutions are kept at too low a level in comparison with the demand for such education.

12172/9716

CSO: 1840/1144

## LIFE PATTERN AND HEALTH STATUS OF PRESCHOOL CHILDREN

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 12, Dec 85  
(manuscript received 22 Mar 85) pp 12-15

[Article by V. Yu. Albitskiy, Gorki Scientific Research Pediatric Institute, RSFSR Ministry of Health]

[Abstract] A survey of 300 preschool children showed many negative factors in the life style of their families: inadequate consumption of hot meals, limited, damp living quarters, lack of physical exercise, minimal outdoor activity, inadequate sleep and excessive passive recreational habits. Parents are not properly informed about health issues and, whatever information they get, they get from news media and not from medical personnel. A socio-hygienic evaluation of the health status of frequently ailing children was carried out at Gorki Scientific Research Pediatric Institute. Analysis of the data showed that social activity indices are the most serious factors affecting children illnesses. The most significant are: day naps, fresh air exposure, adequate summer vacations and regular field trips. Among the physiological factors influencing health status of small children are: delivery history, diseases during the first year of life and diseases of other family members.

7814/9716

CSO: 1840/2007

UDC 618.1/.2-082

## RESULTS OF QUESTIONNAIRE OF PATIENTS ABOUT PERFORMANCE OF FEMALE CONSULTATIVE SERVICE OF CENTRAL RAYON HOSPITAL

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 12, Dec 85  
(manuscript received 4 Apr 85) pp 15-18

[Article by R. M. Muratova, Moscow Oblast Scientific Research Institute of Obstetrics and Gynecology]

[Abstract] Interviews were performed at several rural areas concerning the effectiveness of medical examinations of the rural population by visiting teams from rayon hospitals. The questionnaire included the following aspects: prophylactic examination, frequency of examinations, screening. At this time, the population does not participate willingly in the mass prophylactic examinations. Women attend these examinations very irregularly. Most of the examinations take place at the work sites rather than in the area of their residences. Most of the women who underwent examinations, were satisfied with it. 85% of the interviewed women have had abortions, 30% of which were during the first pregnancy. More educational effort should be expended to lower this statistic. Birth control was practiced, the most frequent procedure being sex abstention (47%). A series of measures was developed to improve the service of gynecological consultative work.

7813/9716

CSO: 1840/2007

## PUBLIC HEALTH PROPAGANDA IN KAZAKHSTAN

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 2, Feb 86 pp 13-16

[Article by S.S. Niyazova, Kazakh Republic House of Sanitary Education]

[Abstract] The approach taken in the Kazakh SSR in public health education measures has some unique features in that it emphasizes the role that personality and subjective factors play in the behavior of workers. The major emphasis is not on the prevention of disease or trauma per se, but instillation in the collective consciousness of proper habits and a healthy way of life. This flexible method has been imparted to medical practitioners to further expand the scope of this approach, with careful attention paid to its application to particular categories of people, e.g., agricultural workers, children, adolescents, the aged, industrial workers, white-collar workers, etc. The entire educational system in Kazakhstan has been mobilized in this program which, together with the mass screening program (dispensarization), will result in a significant improvement in the health indicators for the Kazakh SSR.

12172/9716

CSO: 1840/2106

UDC 613.81:614.86]-07

## IMPROVEMENTS IN DIAGNOSIS OF ALCOHOL ABUSE AMONG DRIVERS

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 2, Feb 86  
(manuscript received 26 Mar 85) pp 23-25

[Article by V.A. Kantariya, D. Ch. Temmoyev, A.A. Gurdzhiyan, A.Z. Kashezhev, N.I. Korovina, B. F. Remeslo and N.S. Shestakova, Republic Narcotics Dispensary Kabardin-Balkar ASSR Ministry of Health, Nalchik]

[Abstract] About 90% of the traffic accidents are due to human factor, in most cases including various psychological problems, among which one of the leading causes is excessive drinking. Determination of serum levels of liver enzymes ( $\gamma$ -glutamyltransferase, aspartate aminotransferase, alanine aminotransferase and glutamyl dehydrogenase) is very informative in diagnosis of chronic alcohol intoxication. This system could be used especially in case of professional drivers, pilots, etc. Analysis of these enzymes was evaluated on taxicab drivers with various degrees of alcohol usage. Non-drinkers served as controls. Only  $\gamma$ -glutamyltransferase showed a three-fold elevation in the group of alcohol abusers. Along with the biochemical method, a psychometric analysis was performed showing some applicability. A recommendation was made to use this enzyme test on all professional drivers, pilots and seamen. References 7 (Russian).

7813/9716

CSO: 1840/2002

## FURTHER IMPROVEMENTS IN MEDICAL EMERGENCY, PLANNING AND CONSULTATIVE SERVICE IN RSFSR

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 11, Nov 85  
(manuscript received 27 Feb 85) pp 3-6

[Article by L.N. Babak, RSFSR Republic Sanitary Aviation Station]

[Abstract] A brief review is provided of the accomplishments and plans for the future of the Medical Emergency, Planning and Consultative Service in the RSFSR. The service is intended to complement existing medical emergency services and is part of the RSFSR Sanitary Aviation Station of the RSFSR Ministry of Health. To date, the service has 116 branches and departments throughout the RSFSR. In 1984, the service responded to some 117,235 calls for assistance, of which 50.9% required transportation provided by sanitary aviation. The service is concerned with postgraduate training, improvements in and accessibility to existing medical facilities, with planning and organization of health delivery systems, and with coordination of existing services to avoid duplication and inefficiency. Special attention is accorded to air transportation, and the development of air ambulances and the medical skills demanded of flight surgeons. The objectives consist of developing such a high level of expertise that it would have a telling effect on the morbidity statistics of RSFSR in the more remote areas.

12172/9716  
CSO: 1840/2102

## SELF-MONITORING AND SELF-EXAMINATION IN MASS HEALTH SCREENING

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 11, Nov 85  
(manuscript received 25 Feb 85) pp 6-8

[Article by Yu. S. Sidorenko, V.I. Pakharin, L.A. Orlovskaya, E.A. Ayzenshtark and T.V. Shelyakina, Rostov Scientific Research Oncology Institute; [Rostov] Oblast Health Department, Rostov-on-Don]

[Abstract] A health calendar and a questionnaire can be one of the more effective means of encouraging self-health care, and can serve as an important adjunct to mass screening programs (dispensarization). Indications are provided as to the specialists to be consulted in the case of a given symptom, and the ongoing self-monitoring provides an anamnestic record. Preliminary experience with this approach has shown that the average age of those complying with all the provisions of this method is 54 years, and such individuals either suffer from chronic conditions or have sustained a serious illness in the past. Individuals in good health generally neglect to take self-care seriously, and preferentially rely on physical maintenance programs such as sports, tourism, physical culture, and so forth. Evidently, more health education programs will have to be implemented to popularize self-health care, and attitudes will have to be modified to regard such records as important medical documents.

12172/9716  
CSO: 1840/2102

## ROLE OF RED CROSS ACTIVISTS IN MASS HEALTH SCREENING PROGRAMS

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 11, Nov 85  
(manuscript received 22 Mar 85) pp 26-27

[Article by N.N. Burdin and V.P. Denisova, Kemerovo]

[Abstract] A discussion is presented of the involvement of the Red Cross organization in the mass screening program (dispensarization) in Kemerovo Oblast. Basically, the Red Cross workers are organized into teams affiliated with various medical institutions, and carry out functions related to monitoring the population for compliance with mass screening requirements. This utilization of the Red Cross workers frees physicians and other medical personnel from routine tasks and concentrates their attention and expertise on actual medical screening and education. Involvement of the Red Cross workers has led to the realistic expectation that, beginning with 1987, 100% of the pediatric population in the oblast will be subjected to mass screening, up to 90% of the working population, and some 60% of the general population.

12172/9716  
CSO: 1840/2102

UDC 61:001.5]:008

## INTRODUCING OPHTHALMOLOGICAL ADVANCES INTO MEDICAL PRACTICE

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 11, Nov 85  
(manuscript received 14 Feb 85) pp 28-30

[Article by L.F. Linnik, Z.I. Moroz and L.Yu. Khanina, Moscow Scientific Research Institute of Ophthalmic Microsurgery]

[Abstract] A brief summary is presented of the programs employed by the Moscow Scientific Research Institute of Ophthalmic Microsurgery in introducing new concepts and techniques in eye microsurgery into general practice. One of the more effective programs is that of postgraduate in-house training with hands-on experience, along with extramural training provided in various regions by expert teams from the institute. Efforts are also made to assure rapid dissemination of information on the latest in instrumentation in the form of short annotations and recommendations in professional journals. Educational measures are also employed as a means of impressing the importance of skill updating by demonstrating, for example, that the use of the latest advances in eye microsurgery has been effective in reducing hospital stays by some 15%, thereby contributing greatly to minimizing loss of work time for medical reasons.

12172/9716  
CSO: 1840/2102

## PROCEEDINGS OF PROBLEMS COMMISSION ON MEDICAL DEMOGRAPHY

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 11, Nov 85  
pp 44-47

[Article by V.I. Dmitriyev, I.V. Lebedeva and Ye.M. Savina]

[Abstract] The Problems Commission on Medical Demography of the RSFSR Ministry of Health held a meeting in June, 1985, in Orenburg, to discuss some of the more pressing problems affecting this branch of the medical sciences. The meeting was attended by staff members of the chairs of social hygiene and public health administration of medical institutes, heads of public health organizations and institutions in the Urals region, and practicing physicians from the Orenburg Oblast. The meeting covered progress in medical demography for the period 1983-1984, and planned research projects for the period 1986-1990. Additional topics that were covered in some detail were the status of rural health, and the state of planned graduates who have successfully defended their candidate and doctoral dissertations in social hygiene and public health administration at the Orenburg Medical Institute. Concluding discussions dealt with the journal "Zdravookhraneniye Rossiyskoy Federatsii", with the work of its editorial board meeting with general approval.

12172/9716

CSO: 1840/2102

UDC 616-002.5-084(574)

## TEAM APPROACH TO MEDICAL SCREENING IN CATTLE-BREEDING RAYONS

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 3, Mar 85 pp 19-21

[Article by A.D. Dzhunusbekov, Z.T. Ryspekov, E.E. Rubilina, G.A. Munaytbasova and K.S. Serikbayeva, Scientific Research Institute of Regional Pathology, Alma-Ata]

[Abstract] Mass screening for tuberculosis was conducted in the cattle-breeding Uygur rayon, Alma-Ata Oblast, on both children and adults to assess the current status of the population and evaluate previous screening programs. The mass screening was conducted by three teams consisting of a pediatrician and two nurses with adequate supplies of tuberculin, hypodermic needles and syringes. In an 18-day period, the campaign encompassed 19,256 children, with 16,416 subjected to tuberculin testing. The data revealed 4.1% of the children had a very strong tuberculin reaction, which also pointed to the inadequacy of screenings conducted in the previous years which resulted in reports of much lower figures. Fluorographic examinations were performed on 80.3% of the adult population, resulting in the detection of 283 individuals with suspicious changes in the thoracic cavity. Subsequent follow-up studies showed that a 5th of them had active tuberculosis, a figure three-fold higher than that reported in 1982. These findings underscore the importance of a well-organized team approach to mass screening for tuberculosis, in order to encompass the highest possible number of the at-risk population.

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## MASS HEALTH SCREENING IDENTIFICATION OF CHILDREN WITH FOOD ALLERGIES IN ALLERGY SECTIONS

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 3, Mar 85 pp 22-24

[Article by M.U. Turlybekov, Chimkent Oblast Pediatric Hospital]

[Abstract] Examination of 160 children with exudative diathesis led to the diagnosis of food allergy in 150 of the patients, based on studies involving elimination diets and skin tests. The food products most commonly involved were milk, egg yolk, candies and tomatoes and apples. In 50% of the cases, the manifestation of the food allergy was in the form of a dry eczema, in 20.6% of the cases moist eczema was present. Neurodermatitis was evident in 16% of the children, respiratory difficulties in 40.6%, urticaria in 16% and gastroenteritis in 24%. Management of the children with vitamins, rest, and elimination diets alleviated the eczema in 80% of the cases. References: 1 (Russian).

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## ATTITUDES AMONG GIRLS TO SMOKING AND ALCOHOL

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 3, Mar 85 pp 17-18

[Article by S.A. Tomashova, All-Union Scientific Research Institute of Social Hygiene and Public Health Organization imeni N.A. Semashko; Chair of Social Hygiene and Public Health Organization, Tselinograd Medical Institute]

[Abstract] A questionnaire study was conducted on 1072 15-18-year-old girls in Tselinograd in order to assess the incidence of smoking and alcohol intake, and their attitudes to such habits. The data indicated that 95% of the girls are aware that smoking has an adverse impact on health, but also that 17% have smoked occasionally. Of the smokers, 22.5% started smoking before the age of 15, 31.8% when 15, and 45.7% when 16 and older. The data also demonstrated that 89.4% of the cohort was aware of the danger of alcohol intake, but that only 29.4% abstained from drinking. In addition, it appears that 50.7% had their first drink by the age of 15. These observations indicate the need for more intensive educational measures in the sphere of substance abuse, as well as more positive role-playing by adults in the family.

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## SOCIAL AND HYGIENIC PROBLEM OF ALCOHOLISM

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 3, Mar 86 (manuscript received 11 Jul 85) pp 12-17

[Article by Ye. I. Lotova, doctor of medical sciences, and Kh. I. Idelchik, candidate of medical sciences, All-Union Scientific Research Institute of Social Hygiene and Public Health Organization imeni N.A. Semashko, USSR Ministry of Health, Moscow]

[Abstract] A historical survey is presented of the medical and social aspects of alcoholism in the Russian Empire and then in the Soviet Union. The damage that this affliction has caused to the state and the people cannot be underestimated, and early efforts made at controlling and prevention of this malady are discussed. Despite the best efforts by the medical authorities and socially-conscious classes, the problem has remained a pervasive one. In the last decades of the 19th century, the problem acquired new urgency, and more resolute steps were taken to combat it by the creation in 1898 of a commission on alcoholism by the Russian Public Health Society. More definitive and resolute efforts were initiated by V.I. Lenin in the first days of the October Revolution, and thereafter the full power of the Soviet government was brought to bear on the problem of alcoholism. However, despite intensive efforts in the medical, educational, and social sectors the problem of alcoholism persists, and it remains the duty of the Soviet society to eradicate it.

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## CONTINUITY IN HOSPITAL AND POLYCLINIC SERVICES

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 3, Mar 86 (manuscript received 1 Jul 85) pp 17-19

[Article by D.A. Dumbrov and B.V. Zhalkovskiy, Odessa Municipal Medical Emergency [Skoraya Pomoshch] Clinical Hospital; Polyclinical Department, No 6 Odessa City Hospital]

[Abstract] A medical history booklet has been devised for the chronically ill to be carried on their person in case of a medical emergency. The booklet contains essential medical history, as well as room for filling in complaints, objective data, and rendered management. The emergency physicians gain immediate familiarity with the case and are able to refer the patients directly to specialists, thereby bypassing the uchastok physicians and assuring speedier delivery of appropriate care. The introduction of this booklet has not increased time expenditure per patient despite an increase in the number of calls answered by the medical emergency mobile teams, since notations in the booklet are made after drug administration and while waiting for their effects. Figures 1; references 3 (Russian).

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## MORBIDITY OF RAILWAY WORKERS

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 3, Mar 86 (manuscript received 6 Jul 85) pp 23-26

[Article by N.I. Velichko, Kiev]

[Abstract] Morbidity patterns were analyzed for engineers and assistant engineers at the Korosten-Podolsk railroad yard, as well as for other workers involved in locomotive maintenance and repair, on the basis of the case histories in the ambulatory clinic. Evaluation of 2775 patient records demonstrated that the morbidity for the engineers (in terms of clinic visits) was 149.20 cases/100 workers, and for the assistant engineers 145.53/100. The visits were most commonly due to respiratory problems (influenza, acute catarrh, angina), neurological disorders (including sensory problems, neurosis, radiculitis), gastrointestinal disorders (peptic ulcers, gastritis), dental problems, musculoskeletal diseases, dermatologic problems, and trauma. The peak incidence of morbidity was encountered in the 30-39 and 40-49 age brackets for the engineers, and 20-29 and 30-39 age range for the assistant engineers. Loss of workdays was generally due to upper respiratory problems. Other systems, e.g., the cardiovascular system, did not figure in the analysis due to job screening which eliminated individuals with such problems. It was felt that a considerable portion of the morbidity could be prevented by more rational scheduling of work shifts, leading to a more normal life-style pattern and less time away from home. References 8 (Russian).

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## MANAGEMENT OF SOCIOPSYCHOLOGICAL SERVICE AT OBLAST HOSPITAL

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 3, Mar 86 (manuscript received 12 Sep 85) pp 27-30

[Article by I.G. Zaytsev, S.V. Lobyin, Yu.M. Lerman and T.S. Rodionova, Tula Oblast Hospital]

[Abstract] In 1982 a sociopsychologic service was established at the Tula Oblast Hospital in response to the problem of high personnel turnover and the difficulty of filling positions. The service staff consisted of physicians, party activists, and administrators who looked into the problem of employee dissatisfaction and devised solutions intended to provide job enrichment. A more open management style emerged as a result of the work of the service, leading to the airing of grievances, and the resolution of personal conflicts, alleviation of monotony, increased recognition, and so forth. As a result, in the 1982-1985 period, personnel turnover decreased by 35% and efficiency and satisfaction of the employees showed corresponding improvements. The experience of the Tula Oblast Hospital is being shared with other similar institutions with like problems, and illustrates what can be accomplished by concerted effort on the part of the administration to meet the challenge of personnel problems. References 3 (Russian).

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NEUROPSYCHIATRIC DISTURBANCES IN THERMAL INJURIES

Moscow SOVETSKAYA MEDITSINA in Russian No 2, Feb 86 (manuscript received 25 Apr 85) pp 74-78

[Article by V.B. Gelfand and G.V. Nikolayev, candidates of medical sciences, Institute of Surgery imeni A.V. Vishnevskiy, USSR Academy of Sciences, Moscow]

[Abstract] Neuropsychiatric correlates are presented for the different stages of burns, demonstrating that such manifestations are reflected in histopathologic changes in the cortical tissues of man and experimental animals. The pathologic brain changes accompanying thermal shock encompass dystrophic and destructive alterations in the ganglionic cells, gliocytes, endotheliocytes and the capillaries. In addition to the cortex, histopathologic changes have been found to affect the reticular formation, thalamus, hypothalamus and the cerebellum. Depression and neurologic sequelae persist after discharge, with some degree of asthenia and irritability in 86% of the patients, along with generalized fatigue. Emotional lability was also a major complication, as well as complaints of dysphoria. These observations indicate that such individuals need long-term care by neurologists and psychiatrists.

References 18: 12 Russian, 6 Western.

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SOCIAL AND PSYCHOLOGICAL ASPECTS OF REHABILITATION

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 11, Nov 85 (manuscript received 7 Jan 85) pp 42-44

[Article by V.A. Petukhov, Yu.M. Dokish, and N. Ya. Rasskazov under the "Progressive Experience" rubric: "Social and Psychological Aspects of Rehabilitation," Leningrad Municipal Hospital No. 40]

[Text] Specialized rehabilitation hospitals and departments have been organized in light of the tasks set before Soviet public health in the decision of the 26th Congress of the CPSU and of the decrees of the CPSU Central Committee and of the USSR Council of Ministers "On Measures for Further Improvement of National Public Health Services" and "On Supplementary Measures for the Improvement of the Health of the Population." Rehabilitation as a new kind of specialized medical help [1] has been attracting the attention of organizers of public health services, clinic physicians, as well as specialists in the area of physical and functional methods of treatment. One of the important aspects of rehabilitation is the social and psychological aspect which affects the personal and social status of the patient, and the patient's relations with state institutions.

Organized in 1974, the in-patient rehabilitation center with a number of specialties, and affiliated with the Leningrad Municipal Hospital No. 40, has beds for trauma, neurosurgery, neurology, and cardio-pulmonary patients, as well as departments of physical therapy, therapeutic physical recreation, and occupational therapy staffed by skilled specialists with higher and secondary education which provide highly effective rehabilitation [2, 3].

For patients starting in-patient rehabilitation, their illness often takes a difficult course and their stay at the hospital is a prolonged one. This gives rise to feelings of social inferiority and the need for social rehabilitation.

The social and psychological aspect of rehabilitation has been insufficiently studied. Patients' everyday social problems which arise in connection with psychological factors have not been examined in their totality and there is no in-depth analysis of the specific nature of these problems. Of particular complexity is the rehabilitation of persons with brain injuries since they

have been observed to have neurotic and psychosomatic disturbances. This has necessitated the organization, at the center, of social and psychological rehabilitation offered by the consulting rooms of a psychiatrist, psychotherapist, and sociologist.

The organizers of this service took into consideration the instructions of well-known scholars of psychiatry and psychology: D. Ye. Melekhov, G. V. Zenevich, M. M. Kabanov, A. V. Kvasenko, and others. In particular, we have relied on four principles propounded by M. M. Kabanov: the unity of biological and psychological reaction, the variety of efforts and reactions in carrying out a rehabilitation program, the appeal to a patient's personality, and the gradual application of medical treatment.

Our five-year experience in giving social and psychological help revealed certain differences in the essence of psychological and sociological problems which appear in psychosomatic patients. We modified somewhat the substance of the rehabilitation of emotionally ill patients, shifting the central focus to the area of psychology (in the traditional approach, rehabilitation is based on psychopathology). Practical experience indicates the inadequacy of the application of individual psycho-social methods and the need for a gradual and many-sided psychotherapeutic system which takes into account the special qualities of each department at the center.

At first the social and psychological rehabilitation service organized its activity in a traditional manner. However, practical experience required a scientifically based approach to the organization of social and psychological help. It became clear that if the patients' social and psychological status were made apparent when they entered the hospital (in a 24-hour period an average of 20-26 people enter), this would allow us to regulate the work of medical specialists and to allocate the flow of entering patients.

With this purpose in mind, we worked out an express system\* which made it possible to allocate patients into three groups depending upon which kind of social and psychological help they require (the help of a sociologist, psychotherapist, or psychiatrist). Express system forms which the patients fill out when they enter the rehabilitation building have five sections: the answers contain information about the patient's everyday social status.

In the years between 1979 and 1983, the express system enabled us to examine 3,260 patients of traumatology, neurosurgery, and neurology. Analysis has shown that 50% of them required psychotherapeutic help; 18-20% sociological help, and 13-17%, psychiatric help. One should note that the need for social-and-psychological help depends most of all on the nature of the illness: thus, 100% of the patients in the spinal department required it.

The express system allowed us to uncover also certain regular changes in the patients' mental state which were connected with illness or trauma. The shift

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\* The express system was worked out by N. Ya. Rasskazov, a staff member of the Leningrad Hospital No. 40 and a candidate of medical sciences, with the participation of Prof. A. V. Khvostenko.

in the patients' thinking with a concentration of interests, thoughts, and feelings on their own body and disease have been precisely traced. The patients' emotional range changes, and a highly emotional fluctuation appears characterized by vacillations in mood from unfounded hopes to a stage of marked depression and even suicidal tendencies.

Depression and depressed reactions are the most frequent forms of a patient's reaction to illness. For clinic physicians, of particular importance is the fact that melancholia, a depressed mood, fear, or anxiety can arise even in a healthy person. The clinico-catamnestic analysis of patients undergoing treatment in the rehabilitation building confirms this conclusion. The express system rather precisely picks up depressed reactions in various stages of their markedness: from slight asthenoneurotic to deep depression with suicidal thoughts. With asthenoneurotic states, patients would go through a course of individual and group psychotherapy along with medicinal therapy, and, at the same time, a sociologist gave them adequate sociological help. With marked psychopathology, hospitalization in a specialized hospital was carried out.

The express system allowed us to uncover also hidden conflicts between hospital personnel and the patients. With the timely intervention of the social and psychological service, conflicts were successfully eliminated in the department without involving the hospital's administration. An analysis of the conflicts disclosed those departments where there was inadequate dentological work, and the administration took the necessary steps in good time.

The express system helped also to distribute the patients in wards according to their psychological compatibility.

#### Conclusions.

1. The experience of the rehabilitation center of Leningrad Municipal Hospital No 40 has shown the need for the organization in such centers of social and psychological help for patients.
2. The express system developed at the center allows for the rapid discovery of a tentative level in the need for social-and-psychological help, and to regulate the work of psychologists and psychoneurologists. The express system can be applied to rehabilitation in a hospital or clinic.

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3. Yu. M. Dokish. In the book: Organization and Effectiveness of Rehabilitation in Medical Institutions. Leningrad, 1980, pp 94-97.

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UDC 616.89:061.3(47+57)"1985"

INFORMATION ON EXTENDED PLENUM OF "MEDICAL PSYCHOLOGY" PROBLEMS COMMISSION  
OF USSR ACADEMY OF MEDICAL SCIENCES

Moscow SOVETSKAYA MEDITSINA in Russian No 2, Feb 86 pp 119-120

[Article by L.I. Vasserman, Leningrad, and V.V. Solozhenkin, Frunze]

[Abstract] A regular plenary session of the "Medical Psychology" Problems Commission of the presidium of the USSR Academy of Medical Sciences was held in Frunze at the Kirghiz Scientific Research Institute of Cardiology. The session dealt with some of the more important current aspects of clinical psychology, psychophysiology, and socioecological ramifications of neuro-psychiatric and psychosomatic disorders. In addition to members of the commission, the session was also attended by specialists in the field from Leningrad, Moscow and Kirghizia. The session also addressed the problem of inadequate participation of clinical psychologists in the management of somatic diseases, and the administrative steps that would have to be taken to redress the situation. Yu.F. Polyakov (Moscow State University) and M.M. Kabanov (All-Union Scientific Center of Mental Health) pointed out the important contribution that clinical psychology could make in research on mental adaptation and compensation in psychosomatic pathology and neurotic conditions.

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CSO: 1840/2113

## CONFERENCES

UDC 615.03:061.3(47+57)

### SECOND ALL-UNION CONFERENCE ON CLINICAL PHARMACOLOGY

Minsk ZDRAVOOKHRANENIYE BELORUSSII in Russian No 12, Dec 85 p 62

[Article by I.K. Danusevich, docent, Minsk]

[Abstract] The 2nd All-Union Conference on Clinical Pharmacology was held jointly with the 10th International Symposium of the COMECON Countries on September 17-20, 1985, in Ordzhonikidze at the North Ossetian Medical Institute. Clinical pharmacology and its teaching at medical schools were the major topics of discussion, although the conference did deal with pharmacodynamics and pharmacokinetics. The field of clinical pharmacology has already been introduced into the medical curriculum of a number of Soviet schools, and has gained recognition as a scientific specialty from the Committee on Science and Technology of the Council of Ministers. The conference ended with a call to commence the teaching of clinical pharmacology at all medical institutes in the 4th and 5th courses, rather than the 6th, to follow, immediately, basic pharmacology which is offered in the 3rd course. An additional recommendation was to encourage "Meditsina" to publish a textbook on clinical pharmacology suitable for teaching purposes in 1987.

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### PLENUM OF GOVERNING BOARD OF BELORUSSIAN SCIENTIFIC SOCIETY OF PHARMACISTS

Minsk ZDRAVOOKHRANENIYE BELORUSSII in Russian No 12, Dec 85 (manuscript received) pp 62-64

[Article by V. F. Gorenkov and Ye.K. Pilko, docents, Minsk]

[Abstract] The plenum of the governing board of the Belorussian Scientific Society of Pharmacists was convened in Minsk on July 2, 1985. The plenum concentrated largely on the development of pharmacy and pharmaceutical practice in Belorussia, covered some historical and administrative matters, and dealt with some current problems concerning advanced training and professionalism. At the present time, the society has 2670 members, of whom two hold the doctorate in medical sciences, 44 are candidates of pharmaceutical

sciences, and 4, 2 and 7 are, respectively, candidates of chemical, biological and medical sciences. The pharmaceutical services have shown remarkable improvement over the years in Belorussia, with the number of unsatisfactorily-filled prescriptions dropping to 0.01% in 1984 from a figure of 1.06% in 1960. The governing board felt that the pharmacists of Belorussia will successfully complete the 11th Five-Year Plan in anticipation of the 27th Party Congress.

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## MISCELLANEOUS

### SOCIAL RESPONSIBILITY IN GEORGIAN SSR

Tbilisi ZARYA VOSTOKA in Russian 12 Feb 86 p 2

[Abstract] In its recent meeting, the Georgian SSR Control Committee covered a number of topics, one of the most pressing of which was the fact that fire prevention is grossly inadequate at many theaters and factories in Georgia. A review was also presented of the accounting practices at various Tbilisi enterprises, including the commercial concern of the Tbilisi Theatrical Society. The practices were found to be quite irresponsible and lacking effective accounting, and warnings were issued to the parties at fault. Violations of safety regulations and hygienic standards were encountered at other enterprises, including the Tbilisi automotive vehicle repair plants which posted unusually high statistics for occupational injuries. In addition to these topics, the meeting also dealt with a number of other problems, e.g. recovery of materials from the Black Sea and Georgian river beds, economic activity and socioeconomic development in Georgia.

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CSO: 1840/1152

### MISMANAGEMENT AND WASTE

Tbilisi MOLODEZH GRUZII in Russian 20 Mar 86 p 2

[Article by A. Glurdzhidze]

[Abstract] The author complains that a considerable waste of intellectual effort and of natural resources takes place in Georgia as a result of mismanagement and neglect to take advantage of available information resources. "The right hand never knows what the left hand is doing", so that, he says, the various industries act on their own without concern how others are affected, while intellectual effort seems to be measured in terms of dissertations produced rather than on their relation to actual needs in the industrial marketplace. Examples are offered where research institutes rely on manual calculations in their design and construction plans, whereas the software to cover such situations is available and waiting to put their computers to use. As a result, the cost of various products remains artificially high, and all because the director and chief engineer of a plant or some other enterprise fail to stay abreast of latest developments in their field. In the final analysis, the workers employed at such enterprises suffer the most because their labor is not cost efficient.

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PHYSICAL CULTURE AND SPORTS--IMPORTANT MEANS OF COMBATING JUVENILE DELINQUENCY  
AND REEDUCATING "DIFFICULT" YOUTHS

Moscow TEORIYA I PRAKTIKA FIZICHESKOY KULTURY in Russian No 3, Mar 86  
pp 35-36

[Article by G. I. Bagdasaryan, Associate Rector for Sports, Armenian State  
Institute for Physical Culture]

[Abstract] This is a summary of efforts to utilize gymnastics and sports as a humane yet disciplined means of combating juvenile delinquency by providing purpose and consequences for carefully followed regimens. Plans for such activities need to take account of conditions that cause negative attitudes in youths, take measures to assure monitoring of behavior, establish positive objectives that are being sought, and apply all these principles in a consistent fashion. Group leaders with negative influence should be isolated and groups of young people reoriented to useful pursuits. Cooperation between administrative agencies, educational and social bodies is essential. The author cites successful efforts by the Yerevan Child and Youth Sport School in pursuing the aims of such physical culture and sports programs with "difficult youths" in the city.

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BEHAVIORAL RESPONSE OF NEWTS TO INTRASPECIES CUTANEOUS SUBSTANCES

Leningrad ZHURNAL EVOLYUTSIONNOY BIOKHIMII I FIZIOLOGII in Russian Vol 21,  
No 3, May-Jun 85 (manuscript received 12 Oct 83) pp 284-289

[Article by S.E. Margolis, Institute of Evolutionary Animal Morphology and  
Ecology, USSR Academy of Sciences, Moscow]

[Abstract] An analysis was conducted on the behavioral response of mature newts to intraspecies cutaneous substances, to assess the significance of skin damage and/or wounds in the release of chemical warning signals. The newts were exposed either to skin washings following injection of the sialagogue pilocarpin, or to water extracts of macerated skin. The effect in general consisted of diminished motor activity, including a decrease in the respiratory rate and in responsiveness to visual food stimuli, and a reduction in buccal movements. These observations show that in newts--in analogy to fish and frogs--skin damage or skin secretions release chemical mediators serve as indicators of damage; these indicators evoke a fear response leading to behavior to avoid detection by predators. Figures 3; references 15: 5 Russian, 10 Western.

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